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LATHYRUS-POISONING IN HORSES.

BY JOSEPH LEATHER AND SONS, M.R.C.V.S., LIVERPOOL.

In the beginning of March of last year (1884), we were asked to see some horses belonging to a team-owner in this city, which were said to be suffering from some peculiar, and apparently epidemic, disease.

The horses said to be affected appeared, when at rest, to be in perfect health, respiration and temperature normal, but the pulse frequent and weak, on an average about sixty per minute. On moving the horses over in the stall, they seemed to stagger somewhat, and to have imperfect control over lateral movement of the hind legs; moving backwards and forwards, however, in most cases apparently normally, although the carters stated that some of the horses had lately become bad backers. On taking a horse out of the stall and exercising it, particularly if a cold wind was blowing, the animal was at once seized with Dyspnœa and roaring. The roaring was not of the ordinary single or expiratory character, but was a well-marked double-roaring from inspiratory and expiratory Dyspnœa. If tracheotomy was now performed there was immediate relief to the symptoms, as was also sometimes the case on merely allowing the animal to rest, and at the same time elevating the nose.

In many cases the Dyspnœa produced sudden death, apparently from Asphyxia ; and in most bad cases where the horse recovered, with or without tracheotomy, large quantities of blood

were coughed up from the trachea. In a few instances the roaring could be brought on by moving the horse somewhat roughly in the stall, and it was noted that even when the roaring was pretty severe, the horse would eat ravenously.

Since, in the course of a few days, a good number—perhaps a dozen—animals were seized in the manner above described, and as nothing of the kind was known in any other stock in town, it was evident that there must be something peculiar to this stable, which we set ourselves to determine.

The stables in which the horses were kept were clean and well drained and ventilated; the animals themselves were in all respects splendid specimens of team horses, of varying ages; the water used was that supplied to the town at large. In the feeding of the animals we found something which we deemed worthy of a closer investigation. For the previous four months they had been fed on Irish lowland meadow-hay, some of which had been badly got; on some American hay, of poor quality; on Indian corn and oats, of the best quality, with occasionally some germs of wheat (*i.e.*, the embryo and cotyledon of the seed, which being yellowish, are removed, in order to improve the colour of the flour), and *Indian mutters*, to the extent of from three to four pounds a day. The mutters were given after being washed in cold water, but they were not steamed or boiled.

After a considerable amount of trouble, we found that these mutters (the name is an Indian generic term for beans, peas, etc., in fact, for the seeds of the *Leguminosæ*) were the seeds of the *Lathyrus sativus* (vetch), grown in India, and recently imported into this country in large quantities as a cheap food for cattle and horses.

From some references supplied by Mr. Reynolds and Dr. Barron, we find that similar symptoms have been previously noted as arising from the use of lathyrus seeds.

An omnibus company in Rouen, France, after consultation with their veterinary surgeon as to some partial substitute for hay, which was at that time very dear, commenced, on October 18th, 1867, the use of vetches in a stable of fifty-four horses, giving each horse from one to two litres a day, continuing this till the middle of January, 1868. On January 12th, one of these horses

was noticed to be affected with weakness of the back and difficulty in walking; on February 27th he had an attack of roaring, for which tracheotomy was performed. This animal was subsequently worked, but died of Pneumonia on April 9th. Of these fifty-four horses, twenty-nine were similarly affected; nine died from Paralysis or from Asphyxia due to roaring, and twenty continued at work at the date of the report, still wearing tracheotomy tubes.*

We have learned that both Roaring and Paralysis are occasionally met with in India, in horses fed too exclusively on ripe lathyrus. The *green* vetch does not appear to produce any untoward results.

In the Indian Annals for 1857, Dr. Irving, of Allahabad, described a form of Paraplegia, or paralysis of the lower limbs, common in Pergunnah Barra, a district on the right bank of the Jumna, which disabled nearly 4 per cent. of the population, and which was known to be entirely due to the consumption of the flour of *Lathyrus sativus*. It was known that a proportion, not exceeding one-twelfth, might be safely mixed with flour or rice; if above one-twelfth, symptoms of poisoning were produced; and if the proportion of vetch-flour exceeded one-third, Paralysis set in, and was often complete in a few weeks. Dr. Irving further states that the symptoms come on during the rainy season, and particularly during the cold nights; and, further, that the female sex is almost entirely exempt from the disease.

In 1882, a similar disorder attacked many members (males only) of a tribe of Kabalye Arabs, in Algiers. This epidemic was investigated by order of the French Government, and put down as depending on the use of the flour of *Lathyrus cicera* during a season of scarcity.

In some parts of Italy, the lathyrus is avoided, the people believing that it produces paralysis of the lower extremities. After looking-up a large number of references on the subject, we find that, as the result of eating vetch-flour in any large quantity, for a period of several months, we may have, in man, paralysis

* The company had several other stables, and in all about 300 horses, but none were affected, except in the stable in which the vetches formed part of the food.

of the lower extremities, attended with spasmodic contracture of the muscles; in the horse, roaring, which is both inspiratory and expiratory, and may prove fatal by Asphyxia, attended in most cases with more or less paralysis of the hind limbs; and in the pig, as in man, paralysis with spasm. So far as we can learn, the lathyrus may be used with perfect safety in feeding oxen and sheep, as it does not appear to produce any symptoms in these animals.

No *post-mortem* examinations appear to have been made on any of the human subjects of lathyrus-poisoning; and in the Rouen epidemic, although several *post-mortems* were made, no lesions are noted, except fatty degeneration of the muscles of the larynx in one case.

We have performed a number of autopsies, but only three with microscopic examinations of tissues. In all cases, the naked-eye appearances were simply those of death from Asphyxia, with the addition, in one case, of well-marked wasting of the following laryngeal muscles on the left side, viz., crico-arytenoidei posticus et lateralis, and the thyro-arytenoideus; in this case, the left recurrent laryngeal nerve was also markedly smaller than the right, and fibrous on section. The lungs, liver, heart, and kidneys, were examined miscroscopically in only one case, and were found healthy. The spinal cord and larynx were examined in three cases, and in all the microscopical appearances were the same, differing only in degree. The lesions found were as follows:—All the intrinsic muscles of the larynx, with the exception of the crico-thyroids, were, to a varying extent, atrophied and replaced by fat. In one case the crico-arytenoideus posticus showed no muscular fasciculi whatever, and in every case examined, each of the muscles showed many fibres of greatly diminished diameter, some having lost all trace of transverse striation, except at points; and in some of the more manifestly affected muscles were to be seen empty and collapsed sarcolemma tubes. In all cases the left, and in two the right, recurrent laryngeal nerves were manifestly atrophied and fibrous in structure. In the case of the third, in the right nerve the change was comparatively slight, and the muscles supplied by it were the least affected of any examined. Under a high power

Fig. 1.

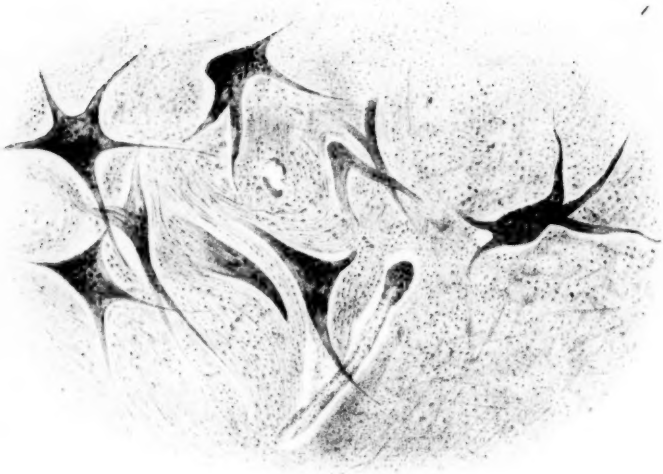

Fig. 2.

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the nerve-fibres were greatly diminished in diameter, with a varying increase in the connective tissue of the nerve. In one left recurrent laryngeal nerve no nerve-fibre could be detected.

The medulla was examined microscopically in only one case, and in this the motor cells in the vagal and accessory nuclei were noticeably atrophied. In the cords, the most marked changes were found in the inferior cornua, the multipolar ganglion cells being atrophied, their processes degenerated or lost, and the cells themselves represented by granular masses of pigment, lying in the otherwise empty lymph space in which these cells are contained. Compare Fig. 1 (annexed plate), a high-power drawing from the motor cells of a healthy cord, with Fig. 2, a drawing, under the same magnification, of a few cells seen in a section of the same area in one of the affected cords. The neuroglia of the grey matter was increased in amount, and in the white matter of the cord there was also, perhaps, a slight increase of this element; but the longitudinal nerve-fibres appeared to be unaltered, as were also the nerve-fibres of the superior nerve roots, while many of the fibres of the inferior roots were atrophied. In one case early descending changes (sclerosis) were moderately well-marked in the superior part of the lateral columns. In all cases there was thickening of the walls of the arterioles and capillaries of the cord, somewhat more marked in the grey than in the white matter. Unfortunately, we did not have an opportunity of making a *post-mortem* examination after the above facts were made out, as to the microscopical appearances of the cord and larynx, or we should have examined the peripheral nerves and skeletal muscles, particularly those of the posterior extremities.

The changes, however, as made out, point to a disease having many of the characters of Acute or Sub-acute Spinal Paralysis as met with in the human subject, and generally known clinically as Infantile Paralysis, or, speaking pathologically, as Anterior Polio-myelitis. As soon as the disease appeared, and before the mutters were suspected, the food appearing to be almost necessarily the cause, or intimately associated with it, was entirely changed, and the horses supplied with good hay, Indian corn, oats, and beans. The affected animals were also treated as

follows :—The bowels were first gently opened, and this was followed by the bi-daily exhibition of adequate doses of Liquor arsenicalis and Tinct. of nux-vomica, alternated with doses of Tinct. gentianæ. co. and Acid. nit. muriat. dil. The application of Ung. hydrarg. biniod. et canthar. over the larynx, along with the internal administration of chlorate of potash, was tried, but without any satisfactory result. In all cases of threatened death from Dyspnœa, tracheotomy was performed, with, as before stated, immediate relief. None of the horses recovered while in the stables; a number were sent to grass, and of these some recovered, while others died.

A point, however, to which we would wish to direct particular attention, is this—that all the horses which recovered were attacked severely, but began to improve within a short time; and that no horse ultimately recovered which did not show marked signs of improvement within a month from the time when first attacked with noticeable symptoms.

The stock, as before stated, consisted of 74 cart-horses and 6 ponies; none of the latter were attacked. Of the 74 cart-horses, 35 were affected, viz., 30 horses and 5 mares. Of the 35 attacked, 19 died, and two were subsequently destroyed as useless; 14 recovered. In 10 cases tracheotomy was performed, and one of these recovered, and is now at work. The first case occurred on March 5, and the last on May 4, nearly eight weeks after the mutters were discontinued.

It having come to our knowledge, in the autumn of last year, that some horses had died in Glasgow from eating mutters, we wrote to Professor McCall, who informs us, under date February 13th, 1885, that 12 horses have died in Glasgow from lathyrus-poisoning.

It is to be noted that our first cases all occurred in the beginning of March, when, after a period of exceptionally mild weather for the season of the year, we had a few weeks of damp, cold weather, with biting east winds; and in Glasgow, although the mutters have been in use for some time, no cases of poisoning appear to have been observed until the early winter. These facts coincide with the date of the Rouen attack, and also with the already-stated facts as to the climatic conditions under which the disease occurs in India.

To sum up:—

FIRST.—As to the cause of the disease. We do not see that there can be any doubt but that the mutters were the sole cause of this outbreak.*

SECOND.—As to the nature of the disease: The lesions in the cord we would certainly regard as being primary, those of the nerves and muscles being secondary, and the cause of most of the symptoms. We should describe the cord lesion as being an *Anterior* (or, better for the horse, *Inferior*) *Polio-myelitis*, more acute in some cases than in others; and in this relation we would call attention to the fact that, as a general rule, this disease, as met with in the human subject, is most rapidly and perfectly recovered from in the more acute cases; which also was the case with the horses.

THIRD.—As to treatment: It is difficult to estimate the value of the medicines given, but some of the horses certainly improved under their use. Several recovered completely while at grass.

FOURTH.—An interesting question now arises. What use can we safely make of the Indian mutter, or vetch? So far as we can make out, from our own unfortunate experience, and from the literature of the subject, it is an extremely dangerous food for horses or pigs. Would boiling or steaming render it safer? It may be used safely for cattle or sheep, even in tolerably large quantities.

NOTE.—While the foregoing paper was in preparation, one of the members of the firm, Mr. William Leather, F.R.C.V.S., who had taken a great interest in this subject, and had read a paper on it before the Liverpool Veterinary Association, in September of last year, died suddenly; otherwise we should have expected to have had the paper ready for the January number of the JOURNAL. We also desire to state that for the microscopic examinations, and the reports of the same, we are indebted to Dr. Barron, Demonstrator of Anatomy in University College, Liverpool.

DESCRIPTION OF PLATE.—Fig. 1, a drawing, under a magnification of about 300, of a group of multipolar cells from inferior cornu of healthy cord of horses. Fig. 2: Drawing, under same magnification, of a similar group of cells in cord of a horse, the subject of lathyrus-poisoning.

* It was suggested, at the commencement of the outbreak, that the disease might be of the nature of a specific fever, but as there was never in any case, so far as we could ascertain, any rise of temperature, and as a careful microscopical examination of the blood in two living cases, and of the tissues in three other cases after death, failed to reveal the presence of any micro-organisms, this does not appear to us to be at all a probable explanation.

NOTES ON A PECULIAR DISEASE AFFECTING MULES, RESEMBLING SCURVY.

BY ROBERT PRINGLE, M.R.C.V.S., A.V.D., BENGAL.

ABOUT the end of 1880, I returned from Afghanistan by route march, with a battery of artillery, to Meean Meer. There were many regiments and batteries on the road at the same time on their way down country. On arrival at Meean Meer many of them handed over their transport, consisting chiefly of mules and ponies, and proceeded to their several destinations by rail. We halted at Meean Meer for some time, when the battery was broken up, and I was posted to the station. Among other duties one was the veterinary charge of the transport.

On going down to the lines of this branch of the service, I found an extensive plain simply covered with mules and ponies. A few belonged to the station, the majority were left behind by regiments gone to various other places. There were several thousands of these wretched animals, left pretty nearly to shift for themselves. There were no lines*; no order prevailed; the native drivers were deserting freely—having been two years in Afghanistan, they were only too glad to get back to their homes again—so there was no one left to care for them; grooming and exercise were equally unknown. It was quite a common thing to see half-a-dozen mules tied up to one peg by their heads, with no heel-ropes, or probably loose altogether. There was no line gear†; no clothing; all the animals were poor, and most of them suffering more or less from sores and injuries.

In a month or so matters improved; lines were formed, so that one could walk about amongst the animals to inspect them; line gear, of sorts, was being issued, and altogether things were looking better. Every three mules had a driver (a helpless coolie from the bazaar) to look after them, but as a rule he was either a small boy or an infirm old man—in either case equally useless, but still any one was better than no attendant at all.

* A piece of level ground, usually drained and furnished with earthen mangers, where horses can be picketted in lines.

† Head and heel-ropes.

I visited the animals only when requested to do so.

Shortly after the beginning of the hot weather, I was requested to give my opinion on a peculiar disease that had broken out amongst the mules. On arrival I found that four had died during the night, four or five were dying, and about twenty were sick. The ones that had died had been sick about fifty hours. I also found out that since the animals had been there (several months) they had received no exercise whatever, and from the day they came there, in their poor, lean state, they had been fed on dry gram and bhoosa* only. I have seen few circumstances that tend better to prove the endurance of the mule than the fact of his existing at all under such treatment.

From those that were sick I could see that all were suffering from the same disease, and showing it in all its ghastly stages. After attending for some days I found the symptoms were as follows :—

When an animal was reported sick, it generally was because it was lame and stiff in one of its shoulders, had a large swelling on the head or neck, under the belly, or on the shoulder ; in nine cases out of ten the latter—a large flat swelling, extending from near the withers to below the elbow, and from the middle of the ribs to half-way up the neck ; very little pain, temperature normal, and animal feeding well.

In about forty hours the swelling became tense, hard, hot, and painful ; *fever ;* the animal dull, off feed, and evidently suffering acute pain. This continued from twelve to twenty hours, at the end of which time a wet line, about a quarter of an inch broad, could be distinctly traced round the swelling, and in another day a slough had taken place, and a large circular piece of muscle and skin, usually about two or three inches thick, and from six to sixteen inches in diameter, was found either to have come away or to be in the act of doing so, leaving the ugliest wound I have ever seen.

The fever now in a great measure abated, appetite returned, and the animal recovered, but with a shoulder destitute of muscle and a leg about as thick as a man's wrist ; it bore no weight on the limb, and was of course useless.

* Barley or wheaten straw chaff.

As a rule they recovered if they lived till after the slough took place, but eighty per cent. died before the wet line was fairly established; occasionally, after the slough took place the whole scapulas, shoulder-joint, and several ribs were left exposed. The wound discharged copiously a yellow fluid, scalding every tissue it came in contact with. I have seen a good deal of Scurvy in the human subject, and I think the peculiar character of the sore on a man's leg, after the slough takes place, identical with that in the case of the mules. Sometimes the swelling took place on the face and under the belly; but in all places it was of exactly the same character.

This was the disease that presented itself to me, and I had never seen anything like it before, or heard of it.

Taking all things into consideration—the want of exercise, entire absence of green food, and the use of such a stimulating grain as "gram," I put the affection down as "Scurvy."

I began by giving a little exercise daily; stopped the whole of the gram and bhoosa, and in their stead gave about twenty-four pounds daily of green wheat, cut just before the ear formed. This was the treatment adopted with the healthy, and it was quite evident that prevention was the thing to aim at. The mule is very fond of green wheat, and in about two days its action on the bowels was established, and in five or six days the disease had entirely disappeared, and was not heard of again for about a year.

Regarding the sick, when seen in the first stage, while the appetite was good, I had the affected animals placed aside, and gave them as much of the green wheat as they could eat. The effect was similar to that of a large dose of aloes. From the commencement I gave about twelve ounces of lime-juice daily. Under this treatment the majority recovered, the swelling going down with wonderful rapidity, and the slough in many instances not being bigger than a man's hand, and very thin. In a few weeks they were fit for work.

Regarding the *post-mortem* appearances, any one who knows Meean Meer as it was then (the thermometer standing at 101° in a large room fitted with every appliance to lower the temperature, while outside a fierce hot wind, laden with dust, blew from

morning till night, and added to this, Cholera raging in the station and district) will, I am sure, forgive me for not being quite so well up in this respect as I might have otherwise been. I only tried to make an examination once; the subject was about half an hour dead. I examined the part that was about to slough, but learned no more than I could have done during life. I had two "sweepers" doing the actual work for me, and any one who knows the ordinary man of that "caste" must be aware that, for all practical purposes, his olfactory nerves are useless. Nevertheless, when the abdomen was opened and gas escaped, the man staggered back, and actually fled from the spot. My nerves of smell are still intact, and being so my feelings may be imagined. I had to give it up, finding it impossible to exist anywhere near the carcase.

About a year after this, while passing through Meean Meer, I met the late Mr. Goldsmith, A.V.D., then in veterinary charge there. He at once began to give me a description of a disease of which the transport mules were dying, and which he could not understand. I went to the lines with him, and there was the malady again. Notwithstanding my advice, and the terrible lesson of the previous year, green food was not supplied, and exercise was in abeyance or insufficient. The same causes were in existence that had produced the disease previously. I told Mr. Goldsmith that I thought the disease was Scurvy, and advised him to do as I had done. The mules were fed on green wheat on his recommendation, and in one week the outbreak ceased.

Two things connected with the disease I cannot understand. First, beyond a "sore back" a mule is seldom ill. In heat or in cold, in hard work or idleness, well fed or starved, he will do as much work and withstand as much hardship as would kill half-a-dozen ponies; yet, though there were as many ponies at Meean Meer as there were mules, all mixed up together, and exposed to the same cause in every way, not one pony ever showed a symptom of the disease.

So far as I have been able to ascertain, the same disease has not been met with out of Meean Meer—perhaps no animals were ever so fed and managed elsewhere; yet this seems unlikely—still I feel sure the locality had nothing to do with it.

I have seen the whole muscle slough, and leave the jaw and molar teeth bare and exposed; at other times the ribs, and sometimes the abdomen. Weak and strong mules suffered alike. It is not contagious. Another strange thing was that the slough took place, certainly in nine cases out of ten, on the *near* side of the animal. I have thought that the disease might be allied to Anthrax, but all veterinary surgeons of experience to whom I have shown cases say that it is quite impossible that it can be so.

THE INTERNAL TEMPERATURE OF THE COW.

BY H. M. SINGLETON, M.R.C.V.S., EALING.

THE following observations were taken on February 17th, 18th, 19th and 20th, 1885, and commenced at 9 a.m. each day. Before commencing, I had my thermometer examined by Negretti and Zambra. The temperature was taken in the rectum, where the thermometer was allowed to remain three minutes in each animal. Of these 100 cows, twenty-five were in calf, the average temperature of which was 101·7° F.; the other seventy-five had previously calved at periods varying from two months to eight, and were in full milk.

101·1	101·3	101·0	102 3
101·8	102·1	101·3	101·0
101·3	101·3	102·1	102·1
101·8	101·8	101·8	101·8
101·8	101·1	100·8	101·8
101·1	101·8	101 8	101·8
101 0	101·0	102·0	101·3
101·5	101·8	101·3	102·3
101·5	99·8	101·8	101·8
101 8	102·0	101·3	102·1
101·3	101·0	101·1	99·8
101·0	101·1	101·5	102·0
100·8	101·5	101·0	101·1
102·8	101·0	100·5	102 8
101 8	101·1	101·5	102 0
101 0	101·1	101·0	102·3
102·1	101·0	101·3	102·0
102·0	100 5	101·0	101·3
101·3	101·1	101·1	101·1
101·3	101 3	102·3	101·8
103·3	101 1	102·1	101·8
101·8	101 5	102·3	101·5
101·8	100·8	102·2	101·3
101·8	101·3	101 5	102·3
101 8	101·1	102·0	101·1

Average temperature of 100 dairy cows = 101·5° F.

OBSERVATIONS ON SOUNDNESS.

BY R. H. DYER, M.R.C.V.S., LIMERICK.

(*Continued from page* 95.)

The visual organ being required to take cognisance of every surrounding object, its size, colour, shape, and form, during the night as well as during the day, it is necessary that the individual so circumstanced should have the power of moving that organ in as many directions as may be requisite. This is done by means of its muscles. Man is not endowed with the same power as the horse is, with regard to the movements of the globe of the eye. The human eye has no retractor-muscle; it is not required. The horse has, he not being possessed of hands. It may be said that the retractor (or that which the muscle influences) is to the horse what a hand is to man. It is necessary that each and every muscle of the globe of the eye, and its appendages, should be well developed, or the probability is sight may be impaired to a certain degree. It is often said of the muscles of the neck and leg that they are but poorly developed; but I have never heard it remarked that the muscles of the eye are in any way defective, except in the human subject, in that peculiar affection termed Strabismus. I do not remember having seen a horse squint; nor I never heard of such an affection. The muscle referred to would, I should imagine, prevent its being done.

This is a subject comparative anatomists may direct their attention to. It has been before remarked that some large horses have small eyes, and *vice versa;* but it has not, I think, been fully and satisfactorily explained. Our attention, as examiners, has been directed almost entirely to the lens. When we take into consideration the many and varied hues of light the horse has to take cognisance of, in daylight as well as in the dark, we need not wonder at his making some serious mistakes when the visual organ is out of order; and in addition to this, he has the ignorance, too often, of an ill-tempered master to influence or to puzzle him in his difficulties. I dare to say every reader of these observations has met with such instances during his career. Too much importance cannot be attached to the

development of muscle in connection with the eye of the horse. The direction in which light travels is always straight lines, if the medium through which it passes is of uniform density. When a ray passes from a rarer to a denser medium, it is refracted or bent towards the perpendicular; when a ray of light passes from a denser to a rarer medium, it will be refracted from the perpendicular; when rays proceed from several points of an object which is luminous, at some distance, and fall upon a double convex lens, they are brought to a focus upon the other side of it, so that an inverted picture is formed upon a screen placed in a proper position to receive it.

A well-known writer says: "The eye, in its most perfect form —such as it possesses in man and the higher animals—is an optical instrument of wonderful completeness, designed to form an exact picture of surrounding objects upon the retina, or expanded surface of the optic nerve, by which the impression is conveyed to the brain. The rays of light which diverge from the several points of any object, and fall upon the front of the cornea, are refracted by its convex surface whilst passing through it into the eye, and are made to converge slightly. They are brought more closely together by the crystalline lens, which they reach after passing through the pupil; and its refracting influence, together with that produced by the vitreous humour, is such as to cause the rays that issue from each point to meet in a focus on the retina. In this manner, a complete inverted image is shown."

Another writer, of equal celebrity, says: "Rays of light, on impinging upon the eye, are refracted through the transparent cornea, those incident on the sclerotic being reflected or absorbed. The cornea may be regarded as constituting the anterior surface of a meniscus lens, of which the posterior surface is formed by the anterior capsule of the crystalline lens, the aqueous humour forming the refracting medium of this fluid refractor. The rays of light which thus tend to be refracted to a focus pass through the pupillary opening of the iris, those passing too near the margin of the lens formed by the anterior chamber being reflected or absorbed; the iris, answering the purpose of the perforated diaphragms in microscopes and telescopes, and being capable of varying its aperture, possesses advantages altogether

unattainable in metallic diaphragms. The pencil of rays having passed through the fluid meniscus, impinges on the crystalline lens, and is there considerably refracted. This refraction is modified by the action of the vitreous humour, the last medium into which the pencil passes; and finally, an inverted image of the object, from the several points of which the rays of light are propagated, is painted on the retina. All rays which are reflected in the interior of the eye, or pass too obliquely for distinct vision, are absorbed by the black pigment with which the interstices and folds of the choroid coat are imbued."

Sir D. Brewster says: "I have found the following to be the refractive powers of the different humours of the eye, the ray of light being incident upon them from air:—Aqueous humour, 1·3366; crystalline lens at surface, 1·3767; centre, 1·3990; mean, 1·3839; vitreous humour, 1·3394. But as the rays refracted by the aqueous humour pass into the crystalline, and those from the crystalline into the vitreous humour, the indices of refraction of the separating surface of these humours will be: From aqueous to outer coat of crystalline, 1·0466; from same to crystalline, using the mean index, 1·0353; from vitreous to crystalline, outer coat, 1·0445; from same to same, using the mean index, 1·0332.'

We are further told by Dr. Bird: "The eye in all warm-blooded animals is formed upon the type of man, with the occasional addition of supplementary structures, better fitting the organ for the performance of vision in the particular animal. In fishes, residing in a medium of nearly the same refractive index as the aqueous humour, the latter fluid becomes useless, and is replaced by a viscid secretion of greater refractive power. The crystalline lens is in these animals nearly spherical, and placed behind the cornea; and the iris, which is close to the latter, is undilatable. In insects, the eye is simple, consisting of a lenticular cornea, placed in front of a nervous expansion. When an object is viewed with both eyes in a healthy condition, it appears single, whilst it is obvious that a distinct image is painted upon each retina. This is readily explained by the fact that the two images, lying exactly in the direction of the optic axis, overlap each other, and virtually produce but one impres-

sion. If the optic axis be not brought to coincide at the place of the object, the two images are separated, and then, as in the case of squinting persons, the object appears double, or confused."

The variation of focal length of the eye has been attributed by some physiologists to an alteration in the form of the crystalline lens by the contraction of its own fibres; but the structure of muscular fibre is so completely identical, from whatever part of the animal kingdom it may have been obtained, and so essentially different from the fibrous structure of the lens, that it appears difficult to conceive the existence of muscularity in that organ; moreover, in all the higher orders of animals, the muscular structures are copiously supplied with blood-vessels and nerves, neither of which have been detected in the crystalline lens.

In order that vision may be distinct, it is necessary that corresponding points of the object and of the retina should be conjugate foci of the eye; or, in other words, that the pencil of rays diverging from each point of the object, and entering the pupil, should converge to a focus on the retina. If, as in myopic, or short-sighted, persons, the rays converge to a focus before they reach the retina, from the too great convexity either of the lens or cornea, they impinge on that sensitive organ in a state of divergence, and the pencils proceeding from contiguous points of any object are superposed upon, and consequently confuse, each other; and the further the focus of incident rays is from the refracting surface of the eye, the further the focus of refracted rays will be from the retina, and consequently the greater confusion; hence, with persons thus affected, the difficulty of discerning objects increases with their distance from the eye. The very term "myopic" is derived from the effort naturally made to diminish the aperture of the transmitted pencils, and consequently the confusion, by partly closing the eyelids, on the same principle that an object placed near to the eye may be seen distinctly through a pin-hole in a card.

A concave lens, of suitable power, by increasing the divergence of the incident pencil, will diminish the convergence of the refracted rays, and consequently carry back each focal point towards the retina; and this is the kind of spectacles worn by short-sighted persons. In presbyopic, or long-sighted, persons,

on the contrary, the lens or the cornea is not sufficiently convex, and as the foci of refracted pencils are consequently situate behind the retina, a similar superposition and confusion of contiguous pencils ensue. In this case it is necessary to diminish the divergence of the incident rays, which is effected by a convex lens, and the convergence of the refracted pencils being thus increased, their foci will be brought forward to the surface of the retina. As the term "presbyopic" implies, this is the state of vision incidental to old age, and arises from the diminution in the convexity of the crystalline lens that naturally takes place in advancing years.

Individuals are not unfrequently met with whose eyes are as insensible to certain tints as the ears of others are to particular sounds. Several cases of this kind have been described, in which the following colours have been confounded by the persons affected with this curious defect of the visual organs: Bright green, with greyish-brown and flesh-red; rose-red, with green and grey; scarlet, with dark green and dark brown; sky-blue, with greyish-blue and lilac-grey; brownish-yellow, with yellowish-brown and grass-green; brick-red and rust-brown, with deep olive green; dark violet, with deep blue. This remarkable state occasionally occurs in disease, and disappears on the patient's recovery.

The author once treated a case of cerebral disease in which vision was previously perfect, but during the attack the patient confounded several tints with each other. The colours mistaken for each other in this instance were, in general, the complementary ones, red being mistaken for green, and orange being confounded with blue. Of the physical cause of this remarkable state, however, nothing is known.

It has been said, "The power of distinguishing colours is not enjoyed but by few persons, although their visual organs are perfect in other respects. An uneducated eye can convey to the brain no peculiar property of the object seen, such as colour, form, and distance—it is acquired by education." We see this in all young animals, and young children also. The hands and fingers of children are essentially useful; they feel the objects placed before them in order to learn their peculiarities. Persons

born blind, and restored to sight in after life, have recourse to the same means to accomplish the desired end. Colts and young calves generally employ their nasal organs for the same purpose, and so do most other animals with which I am acquainted.

ENORMOUS ENLARGEMENT OF THE SPLEEN OF A DOG, RESULTING IN RUPTURE OF THAT ORGAN AND SUDDEN DEATH.

BY W. P. ADAMS, M.R.C.V.S., A.V.D., REMOUNT DEPOT, OSSOOR, INDIA.

THE following case, which recently came under my notice, is, I think, worthy of record, for I am unable to find any mention of a similar occurrence in the dog.

A large Australian deerhound, imported at Madras in May last, died suddenly on the night of the 18th of December. *Post-mortem* examination showed the cause of death to be Rupture of the Spleen. The organ was of enormous size, and occupied the whole of the floor of the abdomen. The base was pressed against the diaphragm, the spleen then extended along the floor of the abdomen till it reached the pelvis; here it doubled on itself till it again reached the diaphragm, when the point was folded inwards.

The weight of this diseased spleen was six pounds, length twenty-one and a half inches, and breadth at widest, nine inches; it was quite a jelly-like mass.

The dog suffered much from the effects of the voyage from Australia, and never recovered; he was always dull and listless, unhealthy in his coat, and altogether out of health. I do not look upon the diseased condition of the spleen as primary disease, but am of opinion that it resulted from general cachexia brought on by the effects of the voyage and climatic influence, as does enlarged spleen in the human subject follow repeated debilitating attacks of Malarious Fever. The rupture had taken place at the doubling of the spleen at the pelvis, and might have been caused by even ordinary exertion, such as getting up or lying down.

BURSATTI: ITS CLINICAL CHARACTERISTICS.

BY RICHARD W. BURKE, M.R.C.V.S., A.V.D., INDIA.

(Continued from page 99.)

At a meeting of the Veterinary Medical Association, held in London, 26th June, 1838, Veterinary Surgeon Armstrong* described the disease as forming "a *painful* tumour which suppurates and breaks;" while Inspecting Veterinary Surgeon Oliphant describes the sore as being "particularly itchy" (VETERINARY JOURNAL, vol. x., July 1880, p. 18).

With respect to the method of removal of the so-called "kunkurs" in the skin, much clever discussion has from the first prevailed. Thus, in a paper on "Tuberculous Disease of Animals in India," Veterinary Surgeon J. T. Hodgson,† in reply to Captain Apperly, pertinently asks: "In the name of forceps, why must these 'kunkurs' be carefully scooped out with the *fingers?* Perhaps there is virtue in a stud-officer's finger, that the *touch* is the cure of the evil, and that it is vain for veterinary surgeons to try."

Veterinary Surgeon J. H. Steel,‡ in a paper on "Every-day Matters in Indian Veterinary Practice," says: "The enucleation of kunkur nodules is quite a novelty, and a very trying and vexatious one in surgical experience. For the latter purpose the finger-nail is perhaps the best instrument, as with it you have a great amount of touch to guide your scraping operations."

Veterinary Surgeon Hodgson was also the first, we think, to compare Bursatti with "Tuberculous Disease" (*Veterinarian*, 1851, p. 131), and hence he spoke of the "kunkur" nodules as being composed of what he termed "scrofula cells." Mr. J. H. Steel, speaking of a certain type of sores occurring on the lips of horses in India,§ which he considers allied to Bursatti, says: "They remind you somewhat of the ulcers seen in calves in that form of Actinomykosis which has been described as 'Tubercular Stomatitis'" (VETERINARY JOURNAL, 1884, p. 132). But are not such contrasts of quite dissimilar diseases? The

* "Proceedings of the Veterinary Medical Association," 1838, p. 236. Hodgson: *Veterinarian*, 1851, p. 132.

‡ Steel: VETERINARY JOURNAL, 1884, p. 132.

§ "*Ichthyosis equinus* in India." By R. W. Burke. In preparation.

sores which Mr. Steel describes as occurring on the lips of horses in India, and which we have also witnessed, have no analogies with Bursatti with which we are acquainted. There are many disorders that are allied to each other, but they are not, therefore, identical. There is not that indurated base here as seen in Bursatti; the histological and pathological characters of the two affections are, moreover, not alike; in fact, although having been noticed by veterinary surgeons in India more or less for the past thirty years, it has never once been found, in the opinion of these, to bear any clinical or pathological analogies with the disease to which I have been alluding.

The disease of the lips which Mr. Steel so well describes, and of which we have ourselves seen so many cases, at least in India, is the common form of Ichthyosis of human dermatologists, and is, even in man, the one form of disease affecting this part which is most frequently mistaken for Cancer.

Mr. Steel* remarks: "Do ordinary wounds become bursattic during the rains? I do not think they do." On this point, it may be well to mention, there is much difference of opinion. What does general experience teach? Veterinary Surgeon Armstrong,† after many years' experience in India, states: "The exposure of common wounds to the action of the air, or to the irritation produced by flies, will *dispose* them to take on the Bursatti character." And we could ourselves adduce many instances in support of this view, but pass on to the opinions of other veterinarians on the subject. Veterinary Surgeon Hart, who has had an extensive acquaintance with this disease during many years' sojourn in India, writes: "Should a simple sore or gall be in existence at the time mentioned, particularly if neglected, it will be very liable to assume malignant or bursattic action" (*Veterinarian*, 1873, p. 17).

And on this point Dr. C. H. Moore: "M. Broca has pointed out, what is undoubtedly true, that the epithelial form of Cancer *does* sometimes arise in the chronic ulcers themselves" (Extract from Dr. Mitchell's work on "Cancer").

The topic of Cancer transformation of ordinary sores has

* VETERINARY JOURNAL, 1884, p. 132.

† "Proceedings of Veterinary Medical Association," 26th June, 1838, p. 287.

therefore, a more extended application than that which we have chronicled as applying to the explanations of Bursatti production in the horse, as compared with the above disease in man. Instances of ordinary sores becoming Bursatti are by no means rare; but perhaps the most interesting thing about this topic, and one which would appear to be overlooked, is the fact of sores having been mistaken for Bursatti which had nothing in common with the nature of that disease, and yielded readily to simple dressings. Many cases of abrasions of the skin, caused by "brushing," on the inner aspect of the fetlocks of the horse, for example, have taken on malignant characters, and terminated into Bursatti; but probably a good many others, recorded as such, had no feature belonging to the last-named affection. Errors in diagnosis in this particular are by no means infrequent, and I have myself been surprised, in not a few instances, being asked to "look at a horse suffering from Bursatti," but which presented none of the characteristics of that disease!

Another fact of great importance in the clinical history of Bursatti is *absence of inflammation characterising the sores*, both before and after the development of the latter. Inspecting Veterinary Surgeon J. J. Meyrick, C.B., in a lecture delivered at the Aldershot Military Veterinary School, in 1881, said the disease was non-inflammatory." And on this point John Hunter* writes: "True suppuration arises from inflammation, terminating in a disposition to heal, which is not the case with Cancer."

Also, the seats of disease in Bursatti are the same as those belonging to Cancer in man (but especially to the epithelial variety of Cancer), namely, on muco-cutaneous surfaces and parts most exposed to friction and the irritation produced by the collection of secretions, of dirt, etc. Hence the favourite sites of Bursatti are seen to be the angles of the mouth,† which are liable to irritation by the bit; the inner aspect of the fetlocks, more especially in horses that are given to habitual "brushing"; the prepuce; the lachrymal‡ region, and elsewhere.

* "On the Blood," 1828, p. 493.

† This is more frequently the seat of the disease in horses belonging to natives, who usually ruin their animals by the cruelly-sharp bits they use—so sharp as often to cut the mouth.

‡ Mr. Meyrick's remarks on the use of *eye-fringes* are significant, and demand attention.

Bearing in mind these facts, we may form a conception of at least the clinical resemblance of Cancer in man and Bursatti as it occurs in the horse—facts which in this particular prove the closest relationship between the human and equine disease.

Again, does Bursatti prove rapidly fatal in its effects? Perhaps very little more rapid than Melanosis* does in the same class of patients, viz., in horses. And, writes Dr. Wilks on this subject affecting man, "Melanotic Cancer is only ordinary Cancer pigmented, *but otherwise just as usual*" ("Pathological Anatomy," Second Edition, p. 239).

With regard to a question that has arisen regarding the fatality of this disease (Bursatti) in the horse, it may be well to mention that operation is seldom practised in these cases, which common opinion would account for the larger number of ill-effects noted in the course of the human disease, where surgical interference is one of the most prevalent modes of treatment in operation.

Dr. T. W. Cooke writes: "The fallacies which surround numerical inquiries regarding Cancer are infinite. What becomes of all that large number of cancerous patients who attend the out-patient rooms of the hospitals for years and years, and who at the same time continue their domestic or other duties with heroic fortitude? From 1851 to the end of 1863, we have had the opportunity of seeing at the Cancer Hospital 413 persons who had been operated on for Cancer; and it will astonish the reader to be told that *the average lapse of time before the disease returned in these cases was no more than six and a half months.*† It is true that, in a very few instances, ten years have elapsed before the disease has again manifested itself." ("On Cancer: Its Allies and Counterfeits," pp. 92-3.) Dr. Mitchell, p. 276, says: "Operation accelerates the activity of the disease by exciting inflammation and activity of the vessels—arterial, venous, and absorbent—of the surrounding part." Dr. Walshe, quoted by Dr. Mitchell,

* "Melanosis in the Horse." By R. W. Burke. VETERINARY JOURNAL, 1882.

† The experience of veterinary surgeons in India shows that Bursatti sores which, with good treatment, subside about the end of September, viz., with the termination of the rains, again redevelop their activity next April or May. It is also true that reported cures of this disease have now and then been recorded in veterinary periodicals.

says: "Cancers which have become quiescent have sometimes been cut out, and the operation been followed by rapid reproduction of the disease." Inspecting Veterinary Surgeon George A. Oliphant writes: "The state of the system existing in Bursatti is not one that indicates the use of the knife" (VETERINARY JOURNAL, vol. x., July, 1880, p. 20).

One more important characteristic of a Bursatti sore is that after an apparent cessation of the disease for months, it may be one, two, or more years, when the morbid process does return, it does so, as a rule, not in remote parts of the body, and indiscriminately, but in structures immediately adjacent to its original site. Can anything different be said of the clinical history of human Cancer? And we have here only dealt with facts of comparison, which, to the best of our belief, have attracted the attention of most veterinarians—exigencies of space not permitting us to give our own quota of experience, where this seemed in agreement with the above citations. The histologic character of the morbid products called *kunkurs* has been already studied by Drs. Fleming and Thin, who have pronounced them to be simple cell concretions. And on this subject Dr. Wilks writes: "After removal of the breast, when the disease returns in the skin and around the cicatrix, it does so as a number of hard nodules, which, when examined, will be found to show compact epitheloid cells imbedded in the meshes of a fibrous matrix" ("Pathological Anatomy," p. 280).

In fine, the veterinarian is struck with the resemblance of the equine to the human disease, whereas, in fact, his sense of conviction comes from having some slight acquaintance with its characters under both conditions—a knowledge of clinical facts, the absence of which put our system of inquiry pursued upon short commons. The inquiries conducted by scientists in their researches concerning the nature of other diseases exhibit this. And there is unquestionably some difference in the methods of inquiry hitherto conducted in regard to this disease, since they have not always been all-embracing in their character, but confined or restricted in scope, and having other deficiencies besides. I am sure that many of our readers will agree with me in regretting the exaggerated rage for preference for one or the other

branch which prevails in these days. It may be a capital procedure, but manifold forms of inquiry are needed that each part of our science may have a share of influence over the study of this disease.

We may, then, admit that there is abundance of room at the present time for still further investigating the subject of Bursatti in India.

The objections that have been raised against our system of comparison adopted are eclipsed, therefore, by the large amount of corroborative evidence we have brought to bear in favour of the identity of the human and equine disease.

Add to these the important fact, that all inoculation experiments hitherto conducted by different veterinary surgeons, as well as those more recently performed by ourselves, positively determine the point in the negative. *The disease cannot be inoculated.*

The explanation with respect to the parasitic nature of this disease appears forced; and we can only say that such a theory of the origin of Bursatti does not at present appear susceptible of application to cases we have been considering, and must therefore be regarded as, up till now, insufficiently established. There is an impression prevailing that if the disease were due to the action of a parasite, that parasite would be readily demonstrable in the morbid products termed *kunkur*, as is natural to expect. Yet the facts are that Dr. Thin, after carefully examining these bodies, failed to find any trace of a parasite alleged to be present in them. And Dr. Thin I knew to be one of the foremost microscopists in England, and not likely to overlook the presence of that which has been thought causative of this disease. More recent examination made at the Brown Institution, London, entirely disproves the notion of a parasitic origin of Bursatti.

Even in the early history of human Cancer it was remarked and suspected that the disease was in some way associated with *parasites*, and so we find in Dr. Mitchell's recent work on "Cancer" a section or chapter chiefly devoted to the consideration of whether the disease had an "*animal, vegetable*, or *animalcular*" origin. This view, however—the parasitic origin of Cancer—has now been dissipated by the careful researches of Kolliker, Lebert, Kolk, Vedl, Paget, Beale, and others, which have proved of the

utmost value in demonstrating in what consists the essential diagnostic test of that destructive disease.

In my consideration of the pathology of Bursatti I have not been moved by any preconceived theory, but by an accumulation of both clinical and pathological facts; and it was only after the acquisition of those facts that I became aware of the beliefs propounded by supporters of the parasitic theory of that disease, which go so far to support the view I have taken, after comparing my observations with the writings of surgeons upon human Cancer.

(*To be continued.*)

Editorial.

DISEASE GERMS.

THE study of diseases which are surmised to be due to the action of germs, is every day attracting increased attention—it may be said, all over the world. The greatest step which has been achieved in medicine, at least in this century, is that in which some of the most deadly maladies have been traced as due to micro-organisms. True, the notion that contagious diseases were due to living particles—*a contagium vivum*—is no novelty. Long ago the hypothesis was started that these disorders were caused by such particulate bodies, and, to a certain extent, upon this hypothesis were based certain preventive measures in their treatment. But it was not until the microscope had been brought into use by careful and philosophical investigators, that this hypothesis was reduced to a solid and substantial fact. To a French veterinarian, Delafond, is due the credit of having been the first to distinguish such particles in the blood of animals affected with Anthrax Fever; and though, at the time, their relationship to the disease was not established, or, perhaps, even suspected, yet the discovery was one pregnant with grand results. Pollender, then Brauell, of the Dorpat Veterinary School, afterwards Davaine and a host of other observers and experimenters, but especially the distinguished veterinarians, Chauveau, Toussaint, and, lastly, Pasteur, have settled all doubts as to the rod-like bodies—the *bacilli anthracis*—being the immediate and direct agents in the production of that most fatal disorder. In more recent times, the organism producing Fowl Cholera has been isolated; at the University of Louvain the germ which gives rise to Contagious Pleuro-pneumonia in cattle was recognised some time ago; Arloing, Cornevin, and Thomas have fixed upon the germ which causes Carbuncular Emphysema (Black Quarter); Koch has incontestably demonstrated the existence of a special germ in Tuberculosis; Schutz and Löffler have proved the presence of a bacillus in Glanders; Semmer, of Dorpat, reports the discovery of special organ-

isms in Rinderpest, Canine Distemper, and other animal maladies. In a large number of other diseases—as Variola, Cholera, Yellow Fever, Relapsing Fever, etc.—organisms have also been detected; and there can scarcely now remain a doubt that in all transmissible maladies in which a particular germ has not yet been found, these will ultimately be fixed upon. The care, close observation, and diverse processes needed to reveal the presence of these exceedingly minute particles is very great. Each appears to have its own particular affinity for some colouring or staining matter, or demands some special method of treatment before it can be made manifest and fixed upon as the *fons et origo mali*. The great number and variety of germs, of microscopical particles, which may be found in a diseased creature is extremely baffling to the investigator; and though one of these may be singled out as the generator of pathological processes, yet the careful seeker after truth would not have the temerity to pronounce definitely upon it until he had put it to the crucial test of isolation, repeated artificial cultivation, and, above all, successful inoculation in a living animal. The utmost circumspection and strongest proof are needed to determine the actual germ which produces a certain disease. Such investigations are generally carried out with the greatest difficulty, and demand extreme patience and great technical skill, as well as a highly-trained intellect, to pursue them. This being the case, we need scarcely wonder that mistakes are frequent, and errors of observation far from being rare, while conflicting opinions are rife in some cases. Not only this, but there seems to be a particular fascination in building up hypotheses with regard to the action of these germs; and until certain points in their life-history and mode of action, or pathogenesis, are made out, this will continue. Those who understand the subject best are slowest in arriving at conclusions; and a certain amount of incredulity is necessary in accepting many statements made with regard to micro-organisms. For instance, Hans Büchner startled the scientific world, in 1880, by announcing that he had been able to convert the bacillus of Anthrax into the harmless *bacillus subtilis*, and the converse. Such a discovery, if real, would have effected a wonderful revolution in biological notions, and some minds actually received it as a fact; but it has now been shown to be a myth, and that no such transformation can be effected—no more than Cow-pox can be converted into human Small-pox, or the reverse. Every malady, we feel certain, has its own special organism or factor, which remains in possession of its distinctive characteristics as rigidly as does the dog or the cat, the carrot or the turnip.

It may be asked to what purpose this research into disease germs can be applied, and those who little understand the import of such discoveries and researches may be inclined to dismiss them with derision; but it may be pointed out that already, both in preventive and in clinical medicine, the knowledge already acquired has been productive of great good, and will yield yet more startling benefits. Protective inoculation with cultivated virus has been introduced only since the existence of germs has been determined, and the greatest advance in surgery made in this,

or perhaps in any other, age has been based on the germ theory of disease; the most formidable operations—operations which could not have been attempted, or were not even dreamt of, not long ago—are now almost daily successfully carried out on the Listerian or Asceptic system. The germ theory gives us light with regard to disease processes where darkness reigned before; and in abnormal, as well as in normal processes, it gives a satisfactory explanation to what was previously hidden or obscure.

PROTECTIVE INOCULATION IN INDIA.

FROM an interesting set of papers just issued by the Government of India, we learn that a laboratory is to be fitted up by the General Superintendent, Horse-breeding Operations, Bengal, for the purpose of systematically preparing and experimenting with virus protective prepared on M. Pasteur's system. To Mr. J. Mills, Army Veterinary Department, and Inspector of Cattle Disease at Madras, the credit is due of being the first to experiment in India on M. Pasteur's system. From the papers we have referred to, we find that in June of last year Mr. Mills conducted a series of experiments on ponies, donkeys, cows, bullocks, buffaloes, sheep, and guinea-pigs—88 in all—with marked success. The animals were inoculated with Pasteur's so-called anthracine, and then "two drachms of blood, taken from the carcases of guinea-pigs dead from Anthrax, were injected under the skin of the neck over the parotid region" in some cases, and "under the skin of the thighs" in others. In the cases of the pony and donkey an abscess, the size of an egg, with a very hard base—in fact, like a carbuncle—formed at the seat of inoculation, but gradually subsided. In the other cases no traces of the puncture were seen. None of the animals went off their feed, and all did well. In addition to these trials, a protected pony and buffalo were sent to a village where Anthrax existed, and were herded with its cattle and grazed on the same pastures, and yet escaped. Protected guinea-pigs were placed in the same cage with others dying from Anthrax, and where there was considerable hæmorrhage from the lungs before death, and yet none became affected. Mr. Mills calculates that it will cost from four to six annas per head per horse, ox, or buffalo, and from two to three annas per sheep or goat, and he urges that the anthracine should be imported from M. Pasteur in France, and systematically employed through the Madras Presidency. The Inspecting Veterinary Surgeon (Dr. G. Evans), however, did not share Mr. Mills' sanguine views, but was inclined, in deference to the reports made by Dr. Klein at the Brown Institute, London, and by Dr. Buchanan, the Medical Officer to the Local Government (London) Board, to doubt whether the fluid would always answer in India. He urged that while M. Pasteur operated successfully, the fluids sold by his accredited agents were not infrequently found not only valueless, but sometimes harmful. He, therefore, suggested further experiments on inexpensive animals before the system should be generally adopted. Accordingly, the Madras Government sanctioned a series of experiments being carried out. On these papers being sent to the Government of India, that Government learnt that experiments had been tried on elephants in Burmah with the most satisfactory results. At no time were the animals off their feed, and although the inoculated animals were re-inoculated with virus taken from a true case of Rinderpest, they escaped without showing the slightest sign of infection. The success in Burmah was considered so satisfactory, that the agents of the Bombay-Burmah Trading Corporation expressed their intention to use Pasteur's fluid on all

their elephants at Mingyan and on the Chindwin Valley forests. With these facts before them, the Government took the sensible step of moving the Secretary of State to direct Mr. J. H. B. Hallen, the General Superintendent of Horse-breeding Operations in India, who happened to be at home on leave, to proceed to M. Pasteur's laboratory in Paris to learn the system, not only of the so-called vaccination, but of the mode of preparing the fluid. Mr. Hallen accordingly went over to M. Pasteur's establishment, and was met by that gentleman's representative, "who most fully explained and demonstrated, with the necessary apparatus, the measures adopted in detecting and cultivating Anthrax germs, attenuating the virus, so as to render it 'vaccine,' of the two kinds, the *premiere* and *deuxieme*" He also pointed out how the operation of vaccination was performed. Mr. Hallen returned to London fully converted to M. Pasteur's theory, but he considered that it would be futile to expect success if India imported its vaccine. He accordingly addressed the Secretary of State, urging that all veterinary surgeons in future be required to go through a systematic course under M. Pasteur, to learn his system of preparing the vaccine and of inoculating cattle, and that the Government of India should establish laboratories at central stations for the manufacture and dispensing of the fluid. The cost involved he calculates at £300 per centre. The Government of India have accordingly directed the establishment of one such centre, which, if it prove a success, will be the pioneer of others to be placed all over India.

Reviews.

ANIMAL PLAGUES: THEIR HISTORY, NATURE, AND PREVENTION. By GEORGE FLEMING, LL.D., F.R.C.V.S., etc. Vol. II. (London: Ballière, Tindall, and Cox.)

A STATISTICAL CHRONOLOGY OF PLAGUES AND PESTILENCES AS AFFECTING HUMAN LIFE. By CORNELIUS WALFORD, F.I.A., F.S.S., etc. (London: Harrison and Sons.)

A second volume of Dr. Fleming's classical work on "Animal Plagues" continues the history of these afflictions from A.D. 1800 to 1844—a most important interval, so far as this country at least is concerned. The volume is a sequel to that published in 1871, which embraced a chronological history of epizoötic, and, incidentally, of epidemic and epiphytic diseases, during the enormous stretch of time between B.C. 1490 to A.D. 1800. The same plan has been followed in this as in the first volume, the record for each year being made to embrace the outbreaks of general disease among animals of different species; the nature and symptoms of the various disorders, and their relation to, and dependence upon, specific, atmospheric, telluric, parasitic, epiphytic, or other influences—all being given, when possible, in the words of the various authors who described them. It is difficult to find language which can adequately and briefly express the paramount interest and importance such a work as this must possess for the historian of civilisation and of human progress, of medicine—human and comparative—of agriculture, and more particularly of sanitary science and veterinary medicine. In the first place, it is a monument of erudition, patience, and research, which few, even among those whose training and leisure might give

them opportunity for such a task, would attempt to rear, and one of which few professions can boast, and of which any might be proud. The term "wonderful" is that which, perhaps, best expresses one's feelings after a perusal of the two volumes, and one rises from them with a sense of the great wealth of general and special knowledge to be found in the records of the past, such as those which had to be unearthed, examined, and studied in the various languages in which they were written, in order to compose the two volumes of the work now before us. This work may be said to be a standard and classical treatise on the subject with which it deals, for generations to come, if not for all time; it is the kind of book that never dies. The multitudinous authorities who have written during all ages on animal plagues, or who have casually referred to these, or to phenomena in connection with them, are quoted literally; thus obviating the need for future students consulting these authorities, and those who know the difficulties that so often present themselves when it is desired to consult original works—many of them so rare that they are only to be found in great libraries, like that of the British Museum—in diverse languages, will be able to appreciate this inestimable advantag e. Thehistory of veterinary medicine is really to be found in this history of animal plagues, and it is traced, from its earliest infancy up to forty years ago, in a most instructive manner; while the origin, course, extension, and ravages of Cattle-plague, Foot-and-Mouth disease, Rabies, Sheep-pox, Glanders, and a host of equally destructive maladies, are given in detail. Not least important, perhaps, are the references to that Protean disease, Influenza, which show that more than a century ago it was as well known as in the present day, and as well described as in any modern veterinary books, though not by the ridiculous names—such as "Pink-eye"—which it receives in these books.

The great importance of a work of this kind cannot be gainsaid, and the subject with which it deals should form a portion of the education a veterinary surgeon receives at college. Its neglect has been highly detrimental to the progress of veterinary medicine, and very injurious to agriculture. The author notices this in his preface to the volume. "The value of a history of contagious diseases of animals," he writes, "cannot be doubted. Had the history of Foot-and-Mouth disease and Contagious Pleuro-pneumonia of cattle on the Continent of Europe, been known in this country as it is exhibited in this volume, these terrible disorders would surely never have been allowed to invade our shores in 1839 and 1841, or when they did appear, they must have been quickly suppressed. The dreadful havoc made by them and other preventible diseases has been largely, if not altogether, due to ignorance of their history; and it is owing to this ignorance that England has been chiefly instrumental in disseminating Contagious Pleuro-pneumonia over nearly the whole world."

This *magnum opus* should be read and studied by every veterinary surgeon and student who aspires to a knowledge of his calling and an acquaintance with its literature. His eyes will be opened at the grand extent of the latter, and his mind cannot be otherwise than elevated and

expanded. We know of no other work of which so much could be said in its praise; it is a scholarly and masterful production, and one which reflects the highest credit on English veterinary medicine.

Mr. Walford's book, which has been printed for private circulation, is the substance of a paper read at a meeting of the Statistical Society in 1882; and the brief chronological notices of human pestilences is preceded by an inquiry into their causes, etc., which embraces some curious facts, but these are chiefly of value to the practitioner of human medicine. G. W. S.

THE VETERINARIAN'S POCKET REMEMBRANCER. By GEORGE ARMATAGE, M.R.C.V.S. Second Edition, Revised. (J. and A. Churchill: London.)

A second edition of Mr. Armatage's handy little work scarcely calls for any comment. As in the first edition, care has been taken to include everything likely to be of aid to the busy practitioner in the treatment of urgent, difficult, or rare cases, and in this edition the subjects and directions appear to be well brought up to date. We can recommend the little book as a trustworthy *aide-mémoire* to all those who require a reminder of how to act in peculiar or unfrequent cases.

THE ANATOMY OF THE HORSE: A DISSECTION GUIDE. By J. M'FADYEAN, M.B., C.M., B.Sc. (W. and A. K. Johnston: Edinburgh and London.)

Professor M'Fadyean has produced a work which may be looked upon as a novelty in veterinary anatomy. The student was already well supplied with text-books of anatomy, some of which treated only of the horse, others of that animal and the chief domesticated creatures, the structure of these being compared with that of the horse. The chief, and most important, of all these is the excellent "Comparative Anatomy of Domesticated Animals," by Chauveau and Arloing, than which nothing better has yet been produced, whether for completeness in detail, clearness in description, arrangement, or illustrations; it being also, to a considerable extent, a dissection manual, in which light it is looked upon in all the Continental schools in which the French language is employed, and also in English-speaking schools, through the translation which was published a few years ago. But the work now before us is essentially, as is stated, a dissection guide to the anatomy of the horse, resembling, to some extent, the manuals which are at the service of the students of human anatomy. As a book for use in the dissecting-room, there can be no doubt that students will find it exceedingly useful, the methodical arrangement and the descriptions being eminently calculated to ensure that object. The coloured plates form a striking feature in the work, the majority of them being original, and well drawn and printed, while their correctness appears to be absolute. There are many woodcuts, the greater number of which are borrowed from Chauveau and Leyh; of these we cannot say so much. Whatever process has been employed in reproducing them, the result cannot be said to be satisfactory, as they are harsh, indistinct, and disfiguring, and greatly depreciate the other-

wise excellent get-up of the book. Perhaps the worst of all is Figure 47—copied, it would appear, from Chauveau—representing the generative organs of the mare; Figures 7, 12, and 19, are not much better. But these are small faults when compared with the great merits which are to be found in a volume that manifests in every page careful and conscientious work by one of the most promising of the younger veterinary teachers in this country. Students should feel grateful for the great assistance he offers them; and if those who avail themselves of his guidance do not become good topographical anatomists, they will only have themselves to blame. The facilities for acquiring a knowledge of anatomy in our schools are now so great, so far as text-books are concerned, that no excuse whatever can be accepted for ignorance of this section of veterinary education. When we remember that, a quarter of a century ago, students had no other help in this direction than was to be found in Percivall's "Anatomy of the Horse," without any information as to how dissections were to be made, we cannot but be struck with the great advantages learners now enjoy. Professor M'Fadyean's book differs in several respects from anything hitherto published in veterinary anatomy, and deserves high commendation for the skill displayed in producing it; while the publishers deserve praise for the manner in which they have done their share of the work.

A Manual of the Theory and Practice of Equine Medicine. By J. B. Gresswell, M.R.C.V.S., and A. Gresswell, F.R.C.S. (London: Baillière, Tindall, and Cox.)

The name of Gresswell is one which has been known and respected for many years in the veterinary profession in this country, and we are glad to find that it is still likely to maintain, and even to enhance, its position in the future, through the production of this excellent work by the two sons of the late member, whose reputation was so firmly established as a sound and accomplished practitioner and a good citizen. Too much praise can scarcely be awarded the "Manual of Equine Medicine," whether for its lucidity, its conciseness, its general trustworthiness, or its high scientific character. It is a model of what a manual should really be in completeness and perspicuity. In its 367 pages it contains more than is to be found in many books nearly twice the size, and yet it embraces everything relating to the subjects on which it treats which is worthy of note. The arrangement is good; there are chapters on the causes, symptoms, and the classification of disease, general pathology, vegetable parasites, general diseases, diseases of the various organs and systems, a chapter on equine entozoa, and another on toxicology. For the student or busy practitioner a better book on the subject is not to be found; the views enunciated are according to the most modern opinions, and the treatment recommended founded upon practical experience, while the morbid anatomy of the different maladies is given in clear, though brief terms. The book is well got up, the typography being a notable feature. One or two little errors might be indicated here and there: as, for instance, when treating of Anthrax, it is stated that Gerlach, in 1845, first demonstrated the contagious character of the disease,

and Pollender, in 1855, first demonstrated the vegetable rod-like organisms, or bacilli anthracis, peculiar to the malady. The history of Anthrax does not appear to be very well understood in this country, mistakes in this respect being common, especially in medical works on the subject. The contagiousness of the disease has been recognised for several centuries; and with regard to the bacilli they were first alluded to by Delafond, in his "Traité sur la Maladie du Sang des Bêtes à laine," in 1845. It was in 1849 and 1855 that Pollender drew special attention to these organisms; Brauell, of the Dorpat Veterinary Institution, also throwing much light upon them in 1857, and subsequently. But such errors as this are of minor importance, and in no way detract from the usefulness of the work, which should prove of great service to veterinary students preparing for examination.

TRAINING AND HORSE MANAGEMENT IN INDIA. By M. HORACE HAYES, M.R.C.V.S. Fourth Edition, Revised. (Thacker, Spink, and Co., Calcutta.)

Though the subject of this work is rather foreign to our literature, it, nevertheless, assumes importance from the fact that horse management in India pertains to the daily routine of duty of the veterinary surgeon in that country, while to others there it demands attention, if they own horses, and have to superintend the training and management of them. To these Captain Hayes' book has been a boon, as is evidenced by the rapidity with which it has passed through three editions; and the edition now issued, which has been carefully revised, will, we feel assured, prove no less useful. In noticing the last edition, we gave an outline of the scope of the work, and we have only now to note that a chapter has been added on teaching horses to jump, and on steeplechase courses, while the vocabulary has been re-arranged. The book now appears to be eminently adapted for its purpose.

Proceedings of Veterinary Medical Societies, &c.

MIDLAND COUNTIES VETERINARY MEDICAL ASSOCIATION.

THE fifty-fourth meeting of the above Association was held at the George Hotel, Walsall, on Friday, January 2nd. The chair was taken by the President, H. M. Stanley, Esq., and there were also present Professor Walley, Edinburgh; Captain Russell, Grantham; R. C. Trigger, Newcastle-on-Tyne; T. Greaves, Manchester; H. J. Cartwright, R. H. Cartwright, and H. D. Pritchard, Wolverhampton; E. Meek, Walsall; J. M. Parker, Birmingham; F. W. Wragg, London; A. Over, Rugby; J. H Reynolds, Daventry; —Smith, Tunstall; H. Blunt, Lutterworth; T. Chambers, Dudley; R. H. Collett, West Bromwich; J. Malcolm, Birmingham; F. Blakeway, Stourbridge, Treasurer; E. Beddard, Wolverhampton, Honorary Secretary.

Messrs. Kettle, of Market Drayton; Fairbank and Bullen, Wolverhampton; J. Blakeway, Stourbridge; and J. Forsyth, Walsall, attended as visitors.

Letters of apology were read from the following members:—Messrs. A. Hodgkinson, Hanley; G. Bland, Alfreton; W. Drewitt, Gloucester; H. R. Perrins, Worcester; C. Moir, Cardiff; J. L. Barling, Hereford; Dr. Fleming, London; T. G. Munck, Northampton; W. C. Barling, Newnham; R. Verney, Stratford-on-Avon; R. Freer, Uppingham; F. W. Barling, Ross; L. C. Tipper, Balsall Heath; W. Carless, Stafford; and A. Green, Dudley.

The minutes of the previous meeting were read by the SECRETARY, and on the proposition of Mr. BLAKEWAY, seconded by Mr. PARKER, they were unanimously adopted.

Mr. BLAKEWAY said since last meeting of the Association the hand of death had removed one of their members He referred to the death of Mr. George Carless, of Worcester, whose father was one of the oldest members of the Association, he might say he was one of its founders. They should be guilty of a dereliction of duty if they allowed that meeting to pass without sending a letter of condolence to the members of the family in their sad bereavement. He therefore proposed "That the Chairman and Secretary be empowered, on behalf of the Association, to send a letter of condolence and sympathy to Mrs. Carless and the members of her family."

Mr. BLUNT seconded the proposition, which was carried unanimously.

Financial.

Mr. BLAKEWAY, Treasurer, then proceeded to read the annual financial statement. He said it would be recollected that this year they had had an extraordinary expenditure, the Association having voted the sum of £50 towards the new college building fund. They commenced the year with a balance to their credit of £93 11s. 5d.; there had been received in subscriptions in 1884 £32 10s, and bank interest £2 16s. 10d., making a total of £128 18s. 3d. After paying off certain accounts, they had now a balance in hand of £120 12s. He must, however, remark that they were not in so satisfactory a condition this year as they were last, inasmuch as they had not a single member in arrears with his subscription, but he was sorry to say that this year there were four members who had neglected to pay their subscriptions. Perhaps that state of things was owing to his want of energy—(No, no)—and probably a younger treasurer would be able to secure the subscriptions more rapidly than he could. (No, no.)

It was then proposed and seconded, and unanimously agreed to, that the statement of accounts be passed.

Election of Officers.

Mr. GREAVES said he rose with very great pleasure to propose a gentleman to preside over their meetings during the ensuing year. The next twelve months of the Association would be a very important period in its history, on account of the meeting of the National Veterinary Association at Birmingham. It was therefore desirable that the person occupying the position of President of the Association should be connected with Birmingham—(Hear, hear)—and he had no doubt he was speaking the wish of every member of the Association when he said that they could not do better than elect the present President. (Hear, hear, and applause.) The name of Stanley was a household word, not only in Birmingham, but throughout the whole county of Warwickshire, and he had conducted the business of the Association in such an able manner that they never stood in a better position than they did at that moment. (Hear, hear.)

Mr. CARTWRIGHT, in seconding the proposition, agreed with the remarks of the proposer, that it was of the utmost importance that a Birmingham gentleman should be President of the Association during the ensuing twelve months.

The CHAIRMAN said he was very much obliged to the proposer and seconder of the resolution for the honour they wished to confer upon him; but he thought it would be better if one gentleman did not continue in office as President more than one year.

Mr. CARTWRIGHT: This is an exceptional year.

The CHAIRMAN said he was sure that there were members of the Association more capable of fulfilling the duties than he was. He hoped they would kindly nominate some one else.

Several members considered that the performance of the duties of President could not be in better hands than Mr. Stanley.

The proposition was then put to the meeting by Mr. GRIFFITHS, and carried unanimously.

The PRESIDENT said he thanked them very much for the honour they had conferred upon him in re-electing him President, the duties appertaining to which he would perform to the best of his ability. He hoped the members would rally round him, and give him all the assistance in their power, when the meetings of the National Association were held at Birmingham.

The CHAIRMAN proposed that Mr. Beddard be re-elected Secretary, and Mr. Blakeway Treasurer. Both of those gentlemen had proved themselves efficient officers and he should like their valuable co-operation and assistance during the ensuing year.

Mr. CARTWRIGHT seconded the proposition, which was unanimously adopted.

On the proposition of Mr. BEDDARD, seconded by Mr. TRIGGER, Mr. E. Meek was elected a Vice-President of the Association.

The CHAIRMAN proposed, Mr. WRAGG seconded, and it was unanimously resolved that Mr. Trigger be a Vice-President.

It was resolved, on the proposition of Mr. TRIGGER, seconded by Mr. CARTWRIGHT, that Mr. Parker be a Vice-President.

Mr. MEEK, in returning thanks for the honour conferred upon him, said that anything he could do to further the interests of the Association he should always esteem it a pleasure and a duty. (Hear, hear.)

Mr. TRIGGER also returned thanks, and endorsed the sentiments of Mr. Meek. He had no doubt that, with the example set before him by their able President, he should not go far wrong.

Mr. PARKER also briefly returned thanks.

PATHOLOGICAL AND CLINICAL CHARACTER OF NAVICULAR DISEASE.—BONE SOFTENING AS A CAUSE OF SPONTANEOUS FRACTURE.

Professor WALLEY then read the following remarks on the above subjects:—

Mr. President and Gentlemen,—My reasons for introducing the subjects I have chosen for to-day's discussion to your notice are that I look upon them, first, as of much importance to the veterinary practitioner, and, secondly, because there are certain points in connection with them which I myself am desirous of seeing more clearly elucidated.

In dealing with Navicular Disease there are three things to which I wish particularly to direct attention, viz., its pathology, its clinical characters, and its treatment. As no definite idea can be obtained of the pathology of an affection until we know something of its etiology, I think our time will be well spent if we devote a little of it to the consideration of the supposed causes of the affection. In perusing the written opinions of eminent members of our profession, one cannot but be struck by the fact that we are, in reference to its causation, but little in advance of those who have preceded us. The original idea, I take it, of veterinary pathologists was, that it had its origin in concussion, and then again this idea was combated on the ground that, if it

so originated, the disease should be as common in the hind as in the fore feet, and that as the navicular bone is not a weight-bearing bone, but is, as it were, "slung" in its position and has passing underneath it a non-concussive substance, viz., tendon, it is impossible for concussion to exert any ill effect upon it. Well, gentlemen, after the lapse of so many years, have we, I would ask, improved upon this idea or provided a satisfactory substitute for it? On the whole, I think, the answer may be given in the negative.

I would ask you to consider, notwithstanding the fact that it is not a weight-bearing bone, and that it is, as I have said, "slung" in its position, whether it is impossible for concussion to play a causal part in the production of navicular caries? Personally, I am of opinion that it does, and particularly in horses with mean frogs and hammering action, and which are constantly worked at a fast pace on hard roads or streets; and not only is there greater weight thrown on the fore than there is on the hind feet, but the incidence of concussive force is different in the hind as compared with the fore.

In the former it is transmitted in an almost straight line from the point of the os pedis to the phalanges, while in the latter it is transmitted through the body of the os pedis, in a vertical direction, and the sole of the fore foot, too, is not so concave as the hind and is more liable to suffer from the effects of contusion from loose (rolling) stones or projecting stones; moreover, I have long held the opinion that the anatomical position of the navicular bone is such as to predispose it to grave interference with its intra-osseous circulation. I have already said that it is suspended in its position; we know that its blood is received through the foramina which exist in its non-articulatory surfaces, and in the various movements of the foot I think it is not difficult to conceive that the safety of its vascular apparatus may be materially jeopardized as no assistance can be given to its capillary circulation, when the limb is in constant flexion and extension, by the propulsive force of its arteries; neither can the aspiratory force usually exerted in the venous circulation be brought to bear here. Hence, the bone is altogether placed in a position highly favourable to the production of vascular derangement in its interior, and the treatment to which the class of horses most liable to it are subjected is further calculated to bring about such derangement.

You are all well aware that it occurs most frequently in horses used for fast work and which are liable to be pulled dead up at any moment, while the whole circulation is in a very excited state, and the stimulus to the circulation suddenly withdrawn by allowing them to stand for minutes and it may be hours in a quiescent condition: this system of treatment is seen in its perfection in horses belonging to butchers, in trotting and in cab-horses; and I may also say in those belonging to veterinary surgeons and to men whose time is occupied by driving their horses to the top of their pace, for the sake of effect, and suddenly pulling up every three or four miles for the purpose of refreshing the inner man.

This kind of treatment, I maintain, is pre-eminently calculated to produce the condition we call "Navicular Disease," by causing capillary congestion in the interior of the bone, and in addition, in some cases, capillary hæmorrhage. In either case, the nutrition of the intimate structures is interfered with, and as a result molecular degeneration follows, leading to the caries which is characteristic of the disease. Another cause frequently overlooked is rheumatic ostitis—this plays its part to a much greater extent than is generally supposed.

From the foregoing remarks it will be gathered that I look upon idiopathic Navicular Disease as purely and simply due to interference with the nutrition of the bone itself and as originating within its interior by a disturbance of its capillary circulation; but while I hold this opinion I am also prepared to admit that, in some cases, an inflammation - rheumatic or otherwise—may

originate in the ligamentous structure of the navicular bursa, or in its synovial membrane, and extend thence to the surface of the bone; but such cases are comparatively few, and are easily distinguished by their macroscopical characters.

Navicular Disease, having its origin in injuries, presents totally different characters, both clinically and macroscopically, from those presented in the idiopathic form; and the specimen I introduce to your notice amply shows this divergence from the ordinary conditions.

Now, gentlemen, from this brief discussion of the pathology of Navicular Disease, I think we may gather some explanation of the widely differing clinical characters it sometimes presents, as also some explanation of the divergence of opinions, as to its existence or non-existence in particular cases, which we occasionally see revealed in courts of law.

Given, particularly, a navicular ostitis having its origin in rheumatism, we can easily understand why half a dozen veterinary surgeons may examine a horse on one occasion and half a dozen on another, and respectively arrive at a different conclusion, each half dozen being *pro tem.* in the right; and I would ask you individually, if you have never met with cases in which the clinical characters of the affection were so well marked that you would, if asked, be prepared to forfeit your professional reputation on your diagnosis, but in which on *post-mortem* examination no trace of Navicular Disease could be found? I confess I have been so deceived on two occasions, and that within the past eighteen months, and the cases were so peculiar that I think it quite worth while to give you the details; they are as follows:—

No. 1.—An aged chestnut mare (lady's hack) had been under observation for several years as being, from the symptoms presented, the subject of Navicular Disease, and during the last few months of her existence she was so lame as to render her useless, but on several occasions indications of the existence of rheumatism were presented in the form of metastatic swellings of the fetlocks. The owner, having an objection to neurotomy, desired me to destroy her; this I did, and the result of the *post-mortem* you have in the two pedal bones I here exhibit, each one of which possesses a symmetrical patch of softened and destroyed tissue, while the navicular bones were perfectly healthy, but the ligamentous tissues gave evidence of well-marked rheumatismal lesions.

No. 2.—An aged well-bred horse, used in a butcher's van. Had also been under my observation for lameness in one fore foot for several months, but no specific request was made to me by the owner to treat the case, until the horse became so lame as to render him nearly useless, and in answer to his inquiry as to what should be done, I said "Unnerve him"; but, from the bulging and softening of the structures in the heel, I gave a very unfavourable opinion as to the results of the operation. A short time after this I incidentally looked into the establishment of a brother practitioner when he directed my attention to a horse which had just been brought in so dead lame as to be incapable of further progression and, after examining the foot, he told the owner that there was only one thing that would be of any avail, viz., neurotomy; in this opinion I unhesitatingly concurred. A few days subsequently I found a horse standing in my forge which, after a casual examination, I detected as the one I had seen under the circumstances just mentioned; and the owner, after some conversation, consented to have him unnerved but subsequently altered his mind and the horse was slaughtered. The result you have in this specimen—no trace of navicular or of pedal disease exists.

One form of Navicular Disease often overlooked, and to which attention has been but slightly directed, is the development of exostoses on the supero-posterior border of the bone; frequently, on macroscopical examination of the foot, are these met with; and occupying the position they do, they must necessarily give rise to lameness, more or less marked, and that too of an obscure charac-

ter. Lastly, in connection with this subject, I wish to make a few observations as to the utility of neurotomy and the methods of performing the operation.

I am very strongly of the opinion that treatment in the majority of cases of navicular lameness is not applied until a lesion, more or less incurable, is established, and that if, on the first sign of such affection being in existence, horses were laid off work and radical treatment—as local bleeding, frog-setoning, with or without counter-irritation (firing or blistering) to the coronet—adopted, we should see fewer confirmed cripples than we now do.

As to the operation of neurotomy, I am of opinion that simple section might be had recourse to in the early stages with advantage; but when the disease is pronounced, excision of a portion of the nerve is the only operation which is likely to be of any practical use, and on the score of humanity alone it should be performed more frequently than it now is.

The methods of performing the operation, though numerous in point of detail, are practically the same; but as I felt very much dissatisfied with the ordinary neurotomes I had one made on a somewhat different principle and when properly used I consider it a superior instrument. Moreover, it may be combined with a needle, which answers the treble purpose of tearing through the connective tissue without injuring the nerve or the blood-vessels, of raising the nerve from its bed, and of passing a ligature round it when it is desirable to do so. It can also be used for the purpose of inoculation for Pleuro-pneumonia in cattle or for suturing wounds. One of the great drawbacks to neurotomy is, in my experience, the rapidity with which reunition of the nerve, in many instances, takes place. If a horse so operated upon works for two or three years, he does well; but when he again becomes lame after the lapse of a few months, the practical value of the operation is materially reduced. Statements have been made in days gone by to the effect that the ends of a divided nerve did not under any circumstances reunite. This statement is not correct, as is frequently shown after the performance of neurotomy, and as has been further demonstrated by direct experiment. What the exact method of reunition may be is of little importance; it is sufficient for us to realise the fact that it does take place, and that, too, in many cases, in an unprofitably short space of time (I have here a specimen in which reunition took place in about six months), and in order to obviate this, I have for some time now advised that a ligature should be placed on the nerve both above and below the point of section, so as to compress the neurilemma, and thus prevent what otherwise takes place—herniation and hyperplasy of the nerve fibrillæ, with the inevitable result—reunition.

In connection with the second subject (bone fragility and softening) to which I wish to direct your attention to-day, I may say that it is one of paramount importance, both clinically and pathologically, and as to the true nature of which we are very frequently in the dark.

Within the past few years the matter has particularly attracted the attention of veterinary practitioners in colliery districts, and especially in connection with *spontaneous fractures*. To this class of cases Mr. Woods, of Wigan, was, I think, the first to direct attention. I have in my possession the ossa pedes and portions of the navicular bones of all the feet of a pony, which were given to me by Mr. F. Ball, pupil of Mr. Brown, of Ormskirk, and in which the flexor pedis has in each case been torn from its insertion into the semi-lunar ridge; and with it a portion of the structure of either the pedal or navicular bone. The accident in these cases seems to occur immediately the animals are brought to the pit-head, and the cause, I take it, is that the animals being so suddenly exposed to the influence of light, lose the co-ordinating control of their muscles, the result being that violent traction is brought to bear on the tendons and the bones, being already softened, yield to the force exerted upon them.

Similar conditions are found to exist in India in imported Australian horses (Walers), and many such cases have been related to me by Mr. R. Rutherford ; but here the lesions are usually localised in the sesamoids and the suffragines. In one district two miles distant from Edinburgh such cases also occasionally occur, and several years ago I attended a carriage-horse in whose limbs the development of splents was followed in quick succession by the formation of bone spavin in each hock, and also partial paralysis, from vertebral softening ; ultimately, in endeavouring to raise the horse by the aid of slings, some twelve or fourteen of the ribs were fractured and he was slaughtered. At a subsequent date I received from Mr. C. Cunningham several bones, with the lacerated tendons of the flexor pedis of one of the limbs, which he had removed from the carcase of a pony. This animal was located, during its life, within a very short distance from the carriage-horse before mentioned.

Bone-softening, leading to spontaneous fracture, is of comparatively common occurrence in pregnant mares, and we are all well acquainted with that form of bone-softening in young animals known as Rickets, though, according to one medical writer, we are quite ignorant of the occurrence of such a lesion.

Osteo-malacia may again arise as a result of prolonged and profuse suppuration, and I have here one of the ribs and a part of the femur, of the left leg, which I removed last year from a cow, and in which more than half the ribs had been fractured by simply turning the animal over from side to side, she being incapable of rising, from paralysis primarily, and sloughing of the muscles of the thigh and of the gastrocnemii tendons, followed by profuse suppuration, secondarily. The lesion is, in my opinion, occasionally produced in young cattle by extravasation of blood into the interior of bones when animals are suffering from blood diseases.

In very fat horses, the bones, especially the vertebræ, are sometimes so soft in consistence as to be easily cut with a knife, and the condition is an unsuspected predisposing cause of fracture, especially in animals cast for operations.

The exact nature of that form of bone-softening known as Osteo-porosis is still a mystery, but as in the case of other forms it is doubtless due to one of three causes : (1) Excessive formation of lactic, lithic, or other solvent acid, producing decalcification ; (2) deficiency of bone salts in the food ; (3) inability on the part of the bone cells to assimilate the pabulum offered to them: but why such mal-nutrition should arise I cannot pretend to offer an opinion. One medical writer has recently made the statement that the porous condition of the bones (from the late Professor Varnell's cases) preserved in the museum of the London Veterinary College, was the result of maceration and drying ; but, much as I admire the general tone of this writer's remarks on this subject, I am compelled to dissent from his conclusions on this point, as the softened and porous condition of the bones can, in these cases, be demonstrated during life as well as after death. The lower maxillæ of two goats, here shown, present the condition very markedly, and I had no difficulty in either case of making a correct *ante-mortem* diagnosis. Curiously enough, both the goats from which I obtained the specimens were comparatively young (two years old) and were generously fed, inasmuch as they had the run of large stables, in which the supply of corn was never stinted.

That the cause of fragility or softening of bone is not always to be found in the absence of proper material for its nutrition from the food, is amply proved even by these specimens alone, but I may remark that on one occasion my opinion was asked in reference to spontaneous fracture of both metacarpii and both metatarsii in a gazelle. The little animal in question had been kept in a comfortable house during the winter and generously fed (mainly on oats), and

when released in the spring from its confinement, it made an ineffectual attempt to leap a high wall, with the result that both metacarpal bones gave way, and subsequently, in endeavouring to find its way back to its house by hopping on the hind legs, both metatarsii became fractured also.

Now, gentlemen, how are we to account for some of these forms of bone-softening in adult animals? Are we to look upon them simply as cases of Rickets of maturity, and due to impaired nutrition as the result of improper food supply; or as due to some change in the vital properties of the bone-cells, as the result of purely intrinsic influences; or as being brought about by the existence of some agent in the blood which exercises a decalcifying effect upon the osseous tissues? In some cases one is inclined to think that the condition is allied to that of juvenile Rickets, particularly when we consider that in the case of fracture of such bones desperate attempts at repair are made, leading to the production of numerous callosities in the ribs and other bones, as is so well illustrated in the specimens from the body of the cow to which I have before referred. In the case of very fat animals it may be a secondary result of fatty changes in the internal organs, especially in the liver, or it may be, at least at the outset, of the nature of an infiltration.

But I confess that the nature of these cases occurring in collieries is still a very great puzzle; I have thought sometimes that the softening process might be due to the solvent action of carbonic acid, which must exist in large quantities both in the air and water of some of our coal mines.

Mr. GREAVES said they were all very much indebted to Professor Walley for the very able paper he had just read. The subjects were very interesting, but they were subjects which neither he nor any one else could make much headway in. With regard to the first subject, although the Professor had given them a very lucid description of it, he had not given them any information as to how to arrest the progress or cure the disease. Mr. Walley was certainly much more hopeful in his treatment of it than he (the speaker) was. He had never cured a case of navicular disease in his life. He had read of cases where the animal was a born cripple, and he remembered one case where the foal had to be held up while it suckled the mare for six or eight weeks. He had lately been reading Turner's work on the disease, and he must confess that it was like chopped straw to him. Not one particle of information could he glean from it. In his opinion there was as much knowledge of the disease forty years ago as there was to-day. With reference to softening of the bone he had seen horses split their pastern when on a level road; he could not account for it, but he did not think it was from softening of the bone. The specimens produced by the Professor were very interesting, and would well repay a good deal of consideration. They had in their streets numbers of horses with bent legs. Considering the result of wear and tear, did the Professor think that the locality of those cases was in the coffin-joint?

Mr. CARTWRIGHT said when a case of navicular disease came under his notice he always recommended unnerving, which was sometimes successful. He had a very successful case only a few days previously; he had tried firing, frog-setoning, and blistering, but he had given up all idea of treating the disease successfully. He recommended unnerving if the feet were strong enough.

Mr. GREAVES said he should like to ask the Professor another question. How was it that horses shod on the Charlier principle were found to lose their high action? He had known a few cases where horses were high-steppers and good goers, and they had become low-steppers, bad goers, and lame. The lameness was of a troublesome kind; it was obscure, and they

were not sure whether it was a Splint or the navicular disease. It was, however, a lameness that would ultimately become permanent. He was of opinion that Charlier's shoes were frequently the cause of navicular disease.

Mr. BLAKEWAY said they might fire a horse for navicular disease, but if the animal was predisposed to the disease it was no good. He had found neurotomy in the majority of cases to act very well. As regards fracture of the bone he had not had much experience, but by what he had seen he had been generally led to the conclusion that it arose from a want of animal matter. It was well known to them that lameness came on suddenly, but if horses were kept quiet for awhile, the animal would get well. Only a short time ago he had a case of a horse with a fractured humerus, caused by excessive muscular action. There was no softening of the bone at all—in fact, quite the contrary.

Mr. WRAGG thought that the question brought before them by the Professor was one of fact more than anything else. Those who had had much to do with navicular disease were pretty much of one opinion that neurotomy was the only remedy.

Captain RUSSELL was also of opinion that neurotomy was the only operation for making a horse suffering from navicular disease comparatively sound, but he must say that it was an operation he did not encourage—(hear, hear)—and for this reason. Some time ago a gentleman in his neighbourhood asked him if he would unnerve a horse suffering from navicular disease. In reply to his questions the gentleman told him that as soon as the horse recovered he would decidedly sell him as a sound horse. He (the speaker) looked upon the horse as not worth 5s. He did not remember a case of a horse making a satisfactory recovery from navicular disease. With regard to softening of the bone he was of the same opinion as Mr. Blakeway, and he had had cases where, from the want of animal matter in the bone, it was as brittle as a piece of chalk.

Mr. MEEK considered that the great point was how to prevent a reunion of the nerve taking place. In several operations he had performed he had found a reunion of the nerve. In one instance he performed an operation on a horse belonging to a neighbouring veterinary surgeon, and the horse got well and appeared perfectly sound. In a few weeks, however, it went lame, and he unnerved it a second time; the horse got well again, and again went lame. The operation was performed a third time, and the horse got sound again—(laughter). He remembered on two occasions more than an inch of the nerve was removed. They knew they could not cure navicular disease, but as a man whose horse suffered from the disease once said to him, "If he will only carry me this season I shall be satisfied." Mr. Meek then referred to the case of a mare which had fractured fourteen ribs, six on one side and eight on the other. During the few weeks the mare lived she took very little food or drink, and yet the recuperative process was carried out, as was shown by a very large deposit connecting each of the fractured extremities. He had had a good deal of experience with colliery horses, but it had never been his lot to meet a case such as Professor Walley alluded to.

Mr. TRIGGER fully agreed with Mr. Meek as regards softening of the bone. The Professor seemed to intimate that it occurred more particularly among colliery horses.

Professor WALLEY: No, no; I referred to that as a particular form.

Mr. TRIGGER said he had had fifteen years' experience of colliery horses, and he could not call to mind a single case where softening of the bone had taken place, although there had been innumerable fractures during that period. Many cases of fracture without displacement had come under his observation, and he had known animals perform some extraordinary feats before

displacement had taken place. In one case, about ten miles from Newcastle, a horse, after jumping a fence, appeared rather stiff, and he was led home, which was about one mile from Newcastle, when it was discovered that he had a hopelessly broken back. He had the vertebræ in his surgery, and it showed a complete fracture. Another case was that of a horse which ran straight into a blank wall. The horse got up stiff, and was taken to the stable, where it remained for several days before it died. A more hopeless case of broken back he never saw in his life. As regards the operation of neurotomy, he did not believe that the result justified such a course, and he, therefore, seldom performed it. If the owner of a horse required a surgeon to neurotomise it, it was only for the purpose of getting rid of the animal. (Applause.)

Mr. G. SMITH said he was not aware of colliery horses being subject to fractures. The idea of the air being impregnated with carbon—the system of the animal would have to be impregnated with it before it would affect the bone.

Professor WALLEY said Mr. Wood, of Wigan, was the first to direct attention to that class of cases among colliery horses. The specimens he had were received from Mr. Brown, of Ormskirk. It was not in the pit where the symptoms presented themselves, but as soon as the horse was brought out of the pit.

Mr. TRIGGER had known sound horses point their feet in the most exaggerated manner, and he should like to know why it was so.

Mr. OVER said he had unnerved hunters, but he could not say that he had been successful in a single instance. Perhaps three or four had worked well for a time, but the disease always returned to them.

The CHAIRMAN remarked that, so far as his experience went in the unnerving of horses, he was quite in favour of it. He had known many cases, even hunters, being hunted for seasons after being unnerved, but if they were to do any good they must get at the disease when it had reached the first stage. The reason why they had not so many cases of navicular disease during the last eight or ten years was owing to the india-rubber soles, which, no doubt, were a great relief to horses. He quite agreed with the remarks of Mr. Trigger, that, as a profession, they should refuse to unnerve horses that were likely to be put into the market as soon as they were better, and disposed of as sound animals. (Hear, hear.)

Mr. GREAVES asked the Chairman whether he had used the india-rubber soles that had a considerable projection over the frog.

The CHAIRMAN, in reply, said he did not like them, because, by having the projection, they put a pressure on the navicular bone instead of on to the sole.

Mr. BLUNT said he had even found horses that would not stand the least pressure with the india-rubber soles on them.

Professor WALLEY, in reply to Mr. Greaves, said in his opinion the case of the foal referred to was more likely to be due to Synovitis; it certainly was not navicular disease. With reference to the hereditary tendency, at one time he did believe in it *in toto*, but he now held a modified opinion. He (the Professor) had known some of the best feet he had ever put his hand on become subject to navicular disease. Although the question of bent legs was not the subject before them, yet he was glad that Mr. Greaves had referred to it. When he was a student Professor Pritchard taught that bent legs was due to contraction of the ligaments at the back of the knee, the result of animals trying to ease themselves after hard work. He (the Professor), however, considered that the contraction of the ligaments was a secondary cause, and that bent legs was due to over-exertion (exhaustion) of the extensor muscles. Referring to the Charlier shoe, he said he knew a gentleman in Edinburgh who professed to know more about horses than most veterinary surgeons, and he saw his horses about

the streets of the city without any shoes at all. The natural result was that the action of the horses was considerably diminished, and their feet greatly injured. That gentleman, he considered, ought to have been prosecuted by the Society for the Prevention of Cruelty to Animals. The Charlier shoe, especially when used in the streets, tended to throw the pressure on the softer parts of the feet, and the result was that the horse was afraid to step out, lost his action, and eventually became lame. Alluding to the remarks of Mr. Blakeway, he said he quite agreed with that gentleman as to fractures of the bone being due to the want of animal matter, in confirmation of which he instanced a case which had occurred in his own practice, and the difference between mollities and fragillitas ossium, so far as the quantity of earthy matter was concerned, was very slight; it rather lay in the fact that in the one the trabeculæ and diploe of the cancellated structure were replaced by fatty matter, while in the other there was a deficiency in fat and medulla, and the bones were lighter and less greasy. With reference to neurotomy, he was of opinion that a veterinary surgeon who unnerved a horse for the purpose of making it fit for sale ought to be drummed out of the profession. (Hear, hear.)

Where, however, a man desired his horse unnerved in order to enable him to get more work out of it, he was in favour of the operation of neurotomy being performed, as it was far better to do so than to keep the animal going about the streets suffering the most horrid torture. The Professor here instanced a case related to him by Mr. Stanley, of Leamington, where a horse which was sold at a big price was passed as sound by a veterinary surgeon, but it afterwards turned out that the horse had been unnerved in the hind leg, where such a thing was never expected. He did not look upon pointing of the feet, necessarily, as a sign of navicular disease. He had known several cases in which horses continually pointed their feet, but never went lame; nevertheless, when he saw a horse point his feet he always looked upon it with suspicion. Alluding to fractured vertebræ, Professor Walley said he always regarded the occurrence of convulsions when the vertebræ were moved as one of the best diagnostic signs. He referred to the length of time animals could work when fractures without displacement had taken place, and said it behoved them not to put them to work too soon. In conclusion, the Professor alluded to softening of a bone, and said he quite agreed with the remarks that had been made that fragility was a cause of fracture, but in most cases he believed it to be due to softening. He then drew the attention of the meeting to a remarkable specimen, the property of Mr. Wm. Stanley, of tarsal exostosis, and also to the leg of a horse (operated upon by Mr. S.), which, during life, went sound for three years after neurotomy had been performed. The Professor then resumed his seat amid applause.

Mr. GREAVES proposed that the best thanks of the Association be accorded to Professor Walley for his ably-written paper. (Applause.) The Professor had come all the way from Edinburgh to give them the benefit of his experience; and he was always prepared to travel far and wide in order to serve his profession. (Applause.) He wished they had more gentlemen like the Professor, who was worthy of their most hearty thanks.

Mr. CARTWRIGHT seconded the proposition, which was then put, and carried unanimously.

Professor WALLEY, in acknowledging the compliment, said it was a pleasure to him to come to the meeting of their Association, for he never came to a meeting of that kind without learning something, so that if he had given them anything, the advantage was mutual. He was exceedingly glad to have the opportunity of being present at the Midland Counties Veterinary Association, because he was a native of the Midlands. He should like to

come among them oftener than he did, but he would at all times have the greatest pleasure in doing everything in his power to further the interests of the Association. (Applause.)

Nomination of Candidates for Executive Council.

Mr. GREAVES, in nominating Mr. Blakeway and Professor Walley, said the Association could not do better than select those gentlemen as candidates to serve on the Executive Council—(hear, hear)—and he hoped their candidature would be successful.

Mr. TRIGGER, in seconding the proposition, said he hoped the Honorary Secretary, Mr. Beddard, would do the same as on former occasions, and write to the secretaries of other associations, requesting their co-operation in securing the election of the two gentlemen named.

The proposition was carried unanimously.

Next Place of Meeting.

Captain RUSSELL proposed that the next meeting of the Association be held at Nottingham.

Mr. BLAKEWAY seconded the resolution with very great pleasure. They had some very good and tried friends in that town, and as they had not been in that neighbourhood for a considerable time, he thought they should pay Nottingham a second visit.

In answer to Mr. Cartwright. the CHAIRMAN said the next meeting of the Association would be held in May.

The resolution was then put, and carried unanimously.

A vote of thanks to the Chairman terminated the proceedings.

About twenty of the members subsequently dined together, at which the healths of the Chairman and Professor Walley were duly honoured.

LINCOLNSHIRE VETERINARY MEDICAL SOCIETY.

(*Continued from page* 203.)

The second disease to which I wish particularly to direct your attention to-day is the so-called "Roup," "Croup," "Diphtheria," and "Gregarinosis" of poultry. The terms "Roup" and "Croup" are used very indifferently in the designation of the diseases of poultry; thus, in some districts, the former term is applied to impaction of the crop as well as to the disease we are about to consider, while the latter is applied also to the affection known as "Gapes." "Gregarinosis" was, I believe, first employed by Continental writers, and the disease was first fully described in this country by Dr. Fleming in his "Veterinary Sanitary Science and Police." The designation was so used because the disease was thought to be due to a psorosperm, the *Gregarina* (M. Balbianii); and the organism was described, and has since been described by Megnin, in the following terms: (1) As sporule-like corpuscles grouped in a loose heap or enclosed in a spherical sac (psorosperms); (2) as egg-shaped corpuscles with a resisting envelope, which open at their extremity, and contain granular matter, undergo segmentation, and produce sporule-like sacs of the first form. The term "Diphtheria" has been employed by various writers. In the first course of lectures delivered by me in the Edinburgh Veterinary College, on "Comparative Pathology," I described the disease as "*Diphtheritic Aphtha*," and I did so because it appeared to me to partake partly of the character of the two affections, and partly because on several occasions I detected, microscopically, in the products, fungus forms such as have been described by Kuchenmeister in certain kinds of Stomatitis. Megnin employs this term also, and further

distinguishes between the two forms assumed by the disease, calling one, when the lesions are localised in the mouth and upper air-passages, *the false membranous form;* the other, when metastic nodules (tubercles) develop in the interior of the body, *Tubercular Diphtheria.* A more recent writer on this subject—Emmerich—also designates the disease in pigeons, Diphtheria. By some writers it has been spoken of as *Tuberculosis.* In a certain degree, in its clinical character and metastatic tendencies, and in its etiology, it bears a striking resemblance to that malady; but its lesions differ in this respect, that in tubercle the nodules undergo calcareous and caseous degeneration; such changes never taking place in the nodules of Roup, but, as in the case of all the other infective granulomata, nodes and nodules are produced, which can never become organised tissue, but which, on the contrary, show a marked tendency to undergo retrogressive changes, and in which the component elements are identical, viz., round embryonal cells, giant cells, epithelial cells, and a reticulated structure. The affection was, a few years ago, limited to a few districts in this country, but it is now very widely spread, and is the curse of many a poultry-yard and many a dove-cote, one remarkable fact in connection with it being that it is confined to the gallinaceæ, and, so far as I know, does not attack the palmipedeæ. I myself first became acquainted with the disease in poultry at Liverpool in 1865, and in pigeons at Edinburgh in 1871; since these dates I have had poultry, pigeons, pheasants, and birds affected with the disease sent to me from all parts of the country. Before saying anything about its specific nature, I will briefly refer to its clinical and macroscopical characters. It attacks birds of all ages, but most largely young ones. Once introduced into a poultry-yard, a dove-cote, or a cage, it spreads rapidly, and lingers for a long time, and not unfrequently makes a complete clearance. It is highly contagious, and its spread is favoured by damp, by overcrowding, by bad ventilation, by bad feeding, and by bad water. Its effects on the system are parasitical, causing inanition and exhaustion, these conditions being frequently increased by diarrhœa and loss of appetite, and pathological lesions producing important and distinctive tissue changes. Its invasion is local—(1) through the medium of the mouth; (2) through the nostrils; (3) through the conjunctivæ; (4) through the external auditory meatus. In the two latter positions it usually remains local, or only extends slowly and in a very limited degree to adjacent structures; in the two former positions its tendency is to spread rapidly to the alimentary tract, and to the respiratory tract respectively; in both cases its lesions ultimately become systemic. As its manifestations are at the outset localised, so are its effects; but in the long run, as in the case of Tuberculosis, it produces a systemic dyscrasia. Its most pronounced local lesions resemble in some respects those of Croup and Diphtheria combined, being made up of collections of a peculiar yellowish-coloured exudative material, which from being at first small rapidly becomes aggregated into large masses; this material is very cohesive in its character, and is in some cases detached with difficulty from the mucous membrane, and when removed by force frequently leaves behind a bleeding surface. In the mouth and fauces these masses are readily seen, as is also a considerable amount of inflammatory redness, with the secretion of viscid mucus and saliva which clings about the mouth, and gives rise to a good deal of annoyance. In the nostrils, the yellow accretion is seen clinging around the edges, while a large quantity of mucus is in some cases poured out from the Schneiderian membrane, and fills up the nasal cavity, interfering with the passage of air and thus causing the animal to breathe through its mouth and to emit a peculiar sound in its endeavour to get rid of the obstruction.

In the ears it presents the same characters; while on the conjunctivæ it forms hard spherical masses, varying in size from a pin's head to a horse-bean.

In no other way are external lesions *primarily* manifested; but *secondarily* we have them developed under the skin of the solar surface of the foot, in the wattle, occasionally in the comb, and in the skin, particularly the skin covering the sternum; its localisation has been probably determined by the irritation set up by contact with the perch. In the foot, large swellings are sometimes formed which cause much lameness, and undergo tardy softening, but even after softening has taken place, stratified masses of the yellow exudate are found lying within the resulting cavity. In the wattle I have never seen softening, the exudate here being also in the form of stratified masses. In the intestines, the masses are presented in various parts, very largely in the cæci, in the form of prominent nodular elevations of a greyish colour, projecting from the mucous membrane into the cavity of the bowel, and not unfrequently producing total occlusion thereof. In one remarkable case, a game chicken sent to me by Mr. Crowhurst, of Amersham, stratified masses of fibrinous exudate, intermingled with coagula of blood, formed a complete cast of the tube, and bore a striking resemblance to a stratified thrombus, while the adjacent intestinal wall was destroyed by ulceration. In the lungs, the lesions presented are—(1) tubercular nodules; (2) rapid softening and total destruction of the parenchyma; (3) complete substitution of the lung-tissue by a plastic exudate, which forms a complete cast of the lung, none of the tissues of which are left intact, except the bronchial tubes and some of the vessels. In the liver, the primary lesions are nodular, and in most cases this form is retained to the end, the liver structure being ultimately replaced by the new growths. Such extensive invasion was present in the organ of a fowl sent to me by Mr. Leach, of Boston. The mesentery is very largely studded with miliary nodules, some pedunculated, identical in general character with those of Tuberculosis, while similar formations are met with, more or less, in other organs; but the most remarkable of all the lesions are the discrete, flattened, oblong nodules met with in the subcutaneous and inter-muscular connective tissue. This lesion is, indeed, sufficient to differentiate the malady from either of the other two forms of infective granulation which so closely resemble it, viz., Tuberculosis and Actinomycosis.

Like causes, it is said, give like results; and the remark is essentially applicable to the casual relations of the disease just mentioned and the one under consideration, the resemblance being further heightened by the fact that inoculation with the products of this disease have been successfully practised between poultry, pigeons, and rabbits, and by myself, to the sheep; and one authority goes so far as to say that it is mutually transmissible between pigeons, rabbits, and a child, though Megnin says the flesh of affected animals may be eaten with impunity. Trasbot has failed to convey it to the pig or the dog, while one of his pupils placed diphtheritic membrane into his own throat without suffering the slightest ill therefrom.

Well, gentlemen, you will naturally ask, What is the nature of the disease, and from what does it arise? For a long period I have felt certain in my own mind that it had its origin in some form or other of micro-organism, and, as I have already stated, I thought some years ago that I had detected the particular organism. Within the last few years my assistant, Mr. Grey, Demonstrator of Practical Pathology in the "Dick" College, has, at my request, worked energetically at this subject, but not until very recently did his work bear fruit. In the early part of this year a lady sent a favourite canary to me, suffering from what she called a warty growth in its eye. A very superficial examination enabled me to satisfy myself as to the nature of the growth (which was about the size of a large pea, and protruding from the conjunctivæ), and I set to work at once to scoop it out. This I succeeded in doing fairly well, but I could still see a quantity of exudate deep down in

the tissues. I had to satisfy myself by touching the cavity with caustic, and giving a very unfavourable prognosis. I preferred the request that the little creature should be brought back to me in the course of a few days; the request was complied with, but the bird was dead, and I at once handed it over to Mr. Grey. On further investigation, as after careful examination of *débris* of the removed nodule he had failed in detecting anything of a decided nature, and, on dissection, it was found that the growth had extended through the structures into the fauces and into the cranial cavity, and along the brain; and on microscopical examination of the latter, Mr. Grey detected what he conceived to be a fungus-like growth, but as neither of us felt satisfied about the true nature thereof, the matter was left for further investigation. On perusing Klein's articles in the *Practitioner* (see Klein's "Micro-Organisms and Diseases," page 78-80), on micro-organisms, my eye was attracted by his sketch of the Cladothrix Dichotona, and on comparing its characters with the fungus in the canary's brain, its identity seemed to me to be completely established. In the *Lancet* of the 25th October you will find an article, already alluded to, by Emmerich on the "Diphtheria of Pigeons" wherein he describes the existence in the false membranes of a short, thick, *bacterium*, which he cultivated in gelatine solution. This bacterium is probably identical with the bacteria in the filaments of the fungus in the brain of the canary, and if this is so, it points to the necessity of searching for such organisms in the adjacent or underlying structures, rather than in the new growths of such affections. Another fact which seems to me to go far towards establishing the nature of this disease is, that the cladothrix is found, according to Klein, in pond-water containing decomposing organic matter, and in practice I have sometimes been successful in suppressing the malady by dissolving fungicides in the drinking-water; moreover, a leptothrix-like organism, called the *Streptothrix Foresterii*, has been discovered by Cohn in the lachrymal canals of man; and Klein considers this streptothrix morphologically identical with the cladothrix.

Now, assuming that this view of the nature of this disease is a correct view, we have not far to go for an explanation of the ordinary method of invasion, viz., by the mouth—exactly as in the case of Actinomycosis in the ox, and Pustular Stomatitis in the horse—and by the nostrils, the pulmonary invasion being due to inhalation of the spores, the systemic invasion following mainly the intestinal and the pulmonary. Such an assumption is further warranted by the new knowledge which we possess with regard to the infective nature of tubercle and of Actinomycosis, and of the proved possibility of systemic infection by the *aspergillus*. And, I would ask, does not the view I have here taken receive strong confirmation from the success which, as I shall presently show, follows the abortive treatment of this and allied diseases?

In reference to Equine Pustular Stomatitis, while I have no actual proof of it, I have no hesitation in saying that it, too, is due to a vegetable organism, and not only so, but that many other diseases of a like character, *e.g.*, Aphtha of young cattle, sheep, and lambs, Eczema labiates of sheep, Epizootic Malignant Catarrh of the sheep and the pig, and Epizootic Conjunctivitis of sheep, are also due to fungi. In reference to Epizootic Conjunctivitis in sheep I have sometimes thought that it was due to pollen grains, especially so when it occurs, as it frequently does, at those times when grasses and other flowering plants are in bloom. Malignant Catarrhal Fever, I am well aware, may be produced by long exposure to an impure atmosphere—a cause frequently in operation to produce it in animals confined in badly-ventilated holds of ships, and in dogs and pigs from insanitary kennels and styes; but in the case of hill sheep no such cause can possibly be in operation, and I feel quite sure, from the cause and results of the disease, that it

has its origin in one form or other of vegetable organism. Eczema of the lips of the sheep is, I know, usually attributed to the irritation of sand and gravel; but I fail to see that such irritation could alone produce the important results we so largely witness in this affection, and I think the idea that it is due to an organism is supported by the fact, that Eczema of the face and legs is sometimes produced in both horses and cattle from the irritation of the pollen grain of alsike clover.

Simple Indigestion does not, in my opinion, account satisfactorily for the great number of cases we sometimes meet with of Aphthous Stomatitis in young cattle and sheep. Some time ago Professor Axe placed on record an outbreak of Aphtha in sheep, which he believed to be due to various kinds of insects infesting the green food upon which the animals were foddered. I should be more inclined to attribute such cases to the effects of fungi.

In reference to the abortive treatment of such affections as those we have been considering, I may remark that while such treatment can only be effectively carried out in the case of those diseases where primary invasion is external and local, we can by intelligent application of general and local remedies materially modify the course of such important maladies even as Foot-and-Mouth Disease. From my experience in the treatment of the maladies to which I have directed your attention, I am in a position to say that their progress can be arrested as certainly and as effectually as can that of Specific Urethritis (Gonorrhœa) in the ox and the dog.

The Professor was heartily applauded on resuming his seat.

The PROFESSOR afterwards added a few words in reference to treatment. In the case of Pustular Stomatitis in the horse, he recommended hyposulphite of soda and chlorate of potash, both of which had a good effect. If there was the slightest debility, he gave also iron. He might also give a simple laxative—sulphate of magnesia, or a little oil, or a small dose of aloes. The food should be nutritious, but of a sloppy character. For local application he suggested a simple application of borax, alum, carbolic acid, and glycerine. A solution of these freely applied to the mouth would at once arrest the disease. In reference to poultry, he specially recommended carbolic acid: a feather dipped in a strong solution of it might be swept round the whole of the buccal cavity, also the fauces of the bird, without doing harm. Perhaps they would think this a heroic remedy, considering that carbolic acid was poison; but it was a fact that a strong application of carbolic acid could be used with much greater freedom than a diluted one. In applying it in this way to the mouth, they would first of all have the bird looking a little sick from pain; then there would be some salivation, but that would be the end of it—the bird would afterwards be as lively as before. When the nose was affected, one of the best things to do was to place the thumb or a finger in the mouth, and by pressing upon the palate to force out as much mucus as possible; then to syringe the nose out with a milder solution of carbolic acid, or carbolic acid and iodine. By following out this treatment he had been very successful; and he mentioned the case of a bird at Dumfries which recovered after this treatment, was afterwards sold for twenty guineas, and won several prizes. As to measures of prevention, in the case of poultry he would have the grass top-dressed with quicklime—thoroughly done—and the houses either burnt down, or the birds at least removed to a fresh place, and the houses thoroughly disinfected. Further than that, he would give hyposulphite of soda, and, if they liked, iron in their water. He might say, however, that he believed the disease might be carried about by eggs, and might even be propagated by chickens. The same lady who sent him the canary bought a setting of eggs from a place where the disease was rampant; the eggs were from hens of Spanish breed. There had been no disease about the place

before, and every bird appeared perfectly healthy until the chickens grew up. When they were about two or three months old they all died, and ther birds also took the disease.

The CHAIRMAN said he was sure they all heartily thanked Professor Walley for the interesting paper he had read. He was quite certain, in his own case, that he had learnt a good deal, and he hoped many others had done the same. It was a subject which they, as provincial veterinary surgeons, could not thoroughly look into, because they had not the time to follow such questions out. Still he felt certain, for his own part, that all these cases were really due to some fungus growth, and he had always had an idea that it might be fungus on the corn—that owing to the dampness of the corn there might be a fungus growth. A case had come under his own notice in which there was no suppuration of the glands, simply eruption of the mouth; and he entirely attributed it to a fungus growth on the oats which the animal had eaten.

Mr. GREAVES was sure they had listened with great pleasure to the able paper which was now before them, leading their minds into the consideration of various types of disease that many of them had never seen, and probably never heard of before. He was himself a stranger to diseases of fowls. He had never had a patient in a fowl in his life; therefore he could not follow the Professor in this part of his subject. With regard to horses, he could scarcely understand the disease that he particularly referred to. The Professor had used terms that were not used when he (the speaker) was at college in 1839. He was now one of the ancient veterinary surgeons, and many new names had been brought into existence since he was a pupil at college. There were some diseases that resembled the disease the Professor had spoken of; for instance, Pyæmia might produce something not unlike what he had been speaking of. In Maligant Sore Throats they would often find abscesses formed between the jaws, and extending round to the front of the face in various parts, with extensive sloughing. Probably if the Professor were to see such cases he would be able to explain whether they were or were not allied to the disease of which he had been speaking. He had listened with great pleasure to his remarks, and he hoped they would have a good discussion on the points which he had raised.

Professor WALLEY said the cases to which he had referred occurred about the time the examinations were going on, and he had a talk with Dr. Fleming about them. He said that it was simply Horse-Pox; but as he (Prof. Walley) had said in his paper, if it was Horse-Pox, it was a remarkable thing that they got no lesions outside the mouth, or extending from the mouth. He had never yet seen Horse-Pox without lesions about the body. In the cases he had described there was not a single eruption outside the mouth. Therefore he said that it was a purely local disorder, due to local causes.

Captain RUSSELL said his experience of Pustular Stomatitis in horses was *nil*, but in reference to the disease of Gregarinosis in poultry he had witnessed three or four outbreaks. There was a specimen lying on the table, which exactly carried out the description Professor Walley had given them. The appearances of the disease, as detailed by the Professor, were in this case most marked; so much so, that as he mentioned them he (Captain Russell) kept noting down in his mind, "That existed—that existed." He might mention that the livers of the birds weighed six, eight, and ten ounces each, and seemed to fill up the whole capacity of the abdominal cavity. He was rather under the impression that Actinomycosis was an allied disease. He thought they would find that if only they could treat these cases in time, in a great majority of instances they would recover. He had at the present time three cases under treatment, and he could safely say they were all

recovering. In a country practice these cases were not brought before their notice very often until the incursion of the disease had gone on for some time, and then it was a more difficult task to get them round again. These outbreaks amongst poultry were all due to the same causes Professor Walley had spoken of—bad feeding, dirty houses, and particularly overcrowding.

Mr. RUNCIMAN expressed the opinion that Tuberculosis was not contagious.

The CHAIRMAN held a contrary opinion.

Mr. GRESSWELL said he had had a case of a calf suffering from Tuberculosis, and he wished to treat with iodoform, but the owner preferred to sell the animal. He thought that iodoform would be very useful in cases of diseases of the tongue. He did not think it was as contagious as some people supposed. They might prevent the spread of the disease by using lime in the water of the trough from which the animals drank.

Captain RUSSELL mentioned the case of a beast suffering from Actinomycosis, which he treated with iodoform, and it recovered.

Mr. HARDY asked if any one had seen a case in sheep. He had inquired of Professor Walley, but he did not know of one. He (the speaker) had one amongst some rams about two years ago, on a heath farm; and that was the only case he had ever heard of. He put it under treatment, and it recovered.

Mr. WHITWORTH stated that about three weeks ago he had a very marked case of Stomatitis Pustulosa under his care; and he was inclined to be of opinion that the eruption extended over the fauces and along the alimentary canal. The duration of the disease was about a fortnight. After four days, occasional symptoms of Colic manifested themselves—not particularly acute—and he administered the ordinary remedies. Two days afterwards there were further symptoms of Colic much more aggravated. From the bowels were passed quantities of mucus, and about the tenth day a large ball of mucus was ejected, streaked with blood. Ultimately, the animal recovered. As to Stomatitis being infectious, he had had two or three cases within the last few months. One he was inclined to attribute to the eating of mouldy seeds. The animal was between two others, all in tolerably good health. The one in the middle was fed upon these seeds, the others were not. Neither of the other two took the disease. It was a perfectly well-marked case. One or two spots of eruption appeared on the outside of the lips. As to Gregarinosis in fowls, he had seen a good deal of it at one time or another. In the latest outbreak which had come under his notice, the fowls had recourse to a river where the water was constantly stagnant, and into which sewage matter passed. The paddock was also badly drained. He had the fowls removed to higher ground; tonics were given, and the disease rapidly disappeared. When the disease was advanced, he believed the chances of recovery very remote.

Mr. SPENCER asked if the so-called "Pip" in chickens—a kind of horny production at the end of the tongue—had anything to do with this disease in poultry.

Professor WALLEY scarcely thought so.

Mr. RUNCIMAN expressed his belief that Stomatitis in calves might arise from their feeding largely upon artificial food.

Professor WALLEY, referring to iodoform, said it was now being spoken of as if it were the great cure-all for everything. His experience of it was not so favourable. If they wanted anything of the kind, they could get nothing better than iodine. Nothing could succeed better than a strong tincture of iodine and carbolic acid. This mixture he had recommended Mr. Leach to use in cases of Actinomycosis, and that gentleman informed him that he had done so with perfect success.

After some further observations,

The CHAIRMAN proposed a cordial vote of thanks to Professor Walley for his paper, which was seconded by Mr. HARDY, and heartily carried.

Professor WALLEY briefly replied, and asked to be made acquainted with any cases of Actinomycosis which might come before the notice of the members.

A vote of thanks to the retiring President, Mr. Mackinder, was proposed by Captain RUSSELL, and, having been acknowledged, the meeting terminated.

The annual dinner of the Society was served on Tuesday afternoon at the Angel Hotel, an excellent repast being placed on the tables by Mr. Childs. Mr. Mackinder, the retiring President occupied the chair; the duties of "Vice" were ably discharged by Mr. Hardy, the newly-elected President of the Society.

After dinner the CHAIRMAN gave the loyal toasts.

Mr. GREAVES, in felicitous terms, proposed the health of Professor Walley, who had come amongst them with that good heart and good feeling which characterised him wherever he went, and whatever he did. He had met him in all parts of the country; and wherever there was a veterinary medical association they would hear of Professor Walley being amongst them. He went for no purpose of his own—he had no selfish motives; but simply desired to benefit the profession. He was sure they would all feel that a deep debt of gratitude was due to him for the able paper which he had read to them that day. (Applause.)

The toast was drunk with musical honours.

Professor WALLEY, in responding, assured them of the very great pleasure which he experienced in attending meetings of this character, and in supporting the interests of the profession in every possible way. Subsequently he proposed the toast of "Prosperity to the Society," and remarked that although nearly the youngest association, yet, from what he had seen that day, he was quite satisfied that although one of the last it was not one of the least—(applause)—neither was it one of the least vigorous. If he had the pleasure of coming amongst them again in the course of a few years he hoped to find that they had made still greater strides. He should always be pleased to assist them, when the opportunity occurred, in maintaining their Society in a state of vigorous health. With the toast the Professor coupled the name of Captain Russell, whom he had met at several association meetings, and who always seemed anxious to do all he possibly could to further the interests of the profession. (Cheers.)

This toast was also received with musical honours.

Captain RUSSELL, in acknowledging the honour which had been done him, said he wished to see the profession take its proper place in the world, and he was also anxious that friendly feelings should exist between himself and every other member of the profession. He was glad if he had been at all instrumental in helping forward the Association; and they might depend upon it that so long as he remained in Lincolnshire, which would probably be to the end of his life, it would be his great aim to make the Society a success. (Applause.)

The VICE-CHAIRMAN next proposed the health of the retiring President, Mr. Mackinder; the toast being received with enthusiasm.

Mr. MACKINDER made an appropriate response.

The proceedings were of an enjoyable and harmonious character throughout, and agreeably terminated a successful anniversary.

CHARLES HARTLEY, *Hon. Sec.*

THE SCOTTISH METROPOLITAN VETERINARY MEDICAL SOCIETY.

THE annual meeting and dinner of this Society were held in the London Hotel, Edinburgh, on Wednesday, February 25th. Professor Walley, the retiring President, occupied the chair until the minutes of the last meeting were read and confirmed; he then vacated it in favour of Professor Williams, the President for the ensuing year.

Amongst those presen: were:—Professors Baird and McAlpine, Dr. Hunter, Dr. Woodhead, Messrs. Rutherford, Cameron, Borthwick, Stewart, A. Baird, A. Grey, W. O. Williams, Cunningham, Aitken, jun., Cassels, W. Connochie, J. Connochie, Burnett, Constable, Hutton, McArthur, Chambers, Rimmer, Duckworth, Shepherd, Moore, Jackson, Robinson, Porch, and the Secretary.

On taking the chair, Professor WILLIAMS thanked the Society for the honour they had done him in electing him President. He hoped the Society would continue to prosper, and should be glad to do all in his power to advance its interests.

The Secretary submitted his report, showing that there was a balance of £26 3s. 5½d. to the credit of the Society; and that there were forty-nine ordinary and three honorary members on the roll. He also read a letter from the National Veterinary Association, stating that the National Association contemplated holding its annual meeting in Scotland next year; but as there were only nine or ten of its members in Scotland, it was requested that the Scottish veterinary surgeons should consider the matter with the view of securing a sufficient number of members to form a local committee to manage the meeting. Ultimately, Mr. RUTHERFORD proposed that the Secretary be instructed to communicate with the other associations in Scotland, asking them to co-operate with the Metropolitan Society in bringing the objects of the National Association under the notice of Scottish veterinary surgeons, and the benefit likely to flow therefrom. Being seconded by Professor WILLIAMS, Mr. Rutherford's proposal, after being supported by Principal WALLEY, was unanimously carried. On the suggestion of the Secretary, a number of those present, who had not previously become members of the National Association, enrolled their names.

Principal WILLIAMS then delivered his

Inaugural Address.

It is now universally conceded that no profession has made greater progress during the last decade than our own, and that the results of this advancement have been of very great benefit to the community, as witnessed by the almost total disappearance of those contagious diseases so destructive to flocks and herds of sheep and cattle, and the lessened bills of mortality amongst our studs of horses.

Diseases that within the memory of the majority of us committed great havoc amongst horses are now treated successfully—the death-rate reduced to a minimum; and, by better sanitation and hygiene, their visitations are much less frequent. These happy results are solely due to the scientific advancement made by veterinarians in the knowledge of their profession—to a more enlightened physiology and a profounder pathology now grasped and comprehended by its members. It is very true that up to within the last two years contagious diseases continued to rage in our midst, and many began to think that legislative measures for their suppression were worse than useless; and had veterinary surgeons, with few exceptions, not resisted this opinion, it is possible that the present legislation for their suppression might have been abolished, and then we should have had agricultural depression indeed. Consider for a moment, gentlemen, the most wretched

condition this country would have been in if, in addition to the present causes of depression, flock-owners and agriculturists had had to contend with Pleuro, or even Foot-and-mouth Disease. It is, therefore, a matter of sincere congratulation that veterinarians have done their duty by the public, and that often against their own pecuniary interest.

Now that Pleuro-pneumonia is likely to become, in this country at least, one of the diseases of the past, it is satisfactory to know that the organism to which it is due has been discovered in the exudates of the disease within, and cultivated in proper fluids outside, the animal body. This result is due to the excellent arrangements of the pathological laboratory of our university, and to the careful attention of Dr. Woodhead, who, with ourselves, has been deeply interested in this matter. The organism of Pleuro-pneumonia is a micrococcus, and found in the exudations present in the lung tissue, as well as in the yellow exudations around inoculated spots. Whilst Scotland and England are almost free from the contagious Lung Disease, there is sufficient evidence to prove that it still remains in Ireland, and that it is due to this fact only that we are not entirely free from it in Scotland, almost every outbreak that we have had to contend against within the last two years being clearly traceable to Irish cattle. This evidently points out something wrong in the inspection of cattle in Ireland, and we have it on the word of Professor M'Call that many inspectors there are non-qualified men. It sometimes, but very rarely, happens that non-qualified men are appointed in Britain, and sometimes in districts where veterinary surgeons are sufficiently numerous. This is much to be regretted, and should at once be remedied.

There is one circumstance in connection with the continuance and spread of Pleuro-pneumonia which should be more generally known, namely, its diffusion by cattle which have recovered from slight attacks of the disease; and I am sure most of you who have had experience of Pleuro will recognise what I now bring before your notice, namely, that when the disease exists in a herd some animals are so slightly attacked as to escape notice altogether, or to present slight symptoms of illness for a day or two only; these animals are often quite recovered before the next visit of the inspector, and his attention is never drawn to them. Again, in those instances where it has been arranged to have the whole herd slaughtered, it will often be found that many cattle which had presented no symptoms of illness during life are more or less affected with patches of lung consolidation; in some the consolidations are in the chronic, in others in the earlier, stages of the disease; very often deeply seated in the lung substance, and so small as to be undetectable during life.

The exudations of Pleuro-pneumonia, unlike those of ordinary exudations, manifest no disposition to become absorbable, but are apt to undergo a semi-caseous change, and to remain in the lungs during the animal's lifetime. Now, gentlemen, these, in my opinion, are the great sources of danger; for at the expiration of the statutory period of fifty-six days after the slaughter or death of the last recognisable case of the disease, these animals are allowed to be taken to market, and to travel to all parts of the country. Now, I am strongly of opinion that no animal which has been in contact with affected cattle should be removed unless for slaughter, as I am fully convinced that the contagion will remain in an animal, no matter how slightly it may have been attacked, for an indefinite, but long, period—months, perhaps years.

I had hoped that we might have been able to congratulate the country on the absence of the Foot-and-mouth Disease, but I am sorry to say that within the last fortnight it has been allowed to gain entrance to our shore, both at Deptford and Hartlepool. In the face of the last regulations regarding the importation of foreign animals, this points out to some great neglect

on the part of the authorities here, and is to be much regretted ; it, however, dispels the idea held by some, and to which I had to refer some time ago, that the disease is of native origin.

Whilst we have, I think, successfully overcome the terrors of Pleuro-pneumonia, I am sorry to confess that Distemper in the dog still remains a very fatal affection, many valuable young dogs dying every year, and that in spite of the most modern system of treatment. By modern system, I mean that which avoids inflicting torture and the administration of drastic remedies, and the starvation, notwithstanding their universally fatal results, still pursued even by a few members of the profession. I am of opinion that a special study of this disease, with a view of devising preventive measures, will open a new field of experimental medicine ; and having this object in view, I am now making cultivations from various fluids obtained from dogs suffering from this disease, and hope in a short time to give some definite results.

During the past year our literature has been added to by the publication of a work on anatomy by Professor M'Fadyean, a book which does great credit to the author, proving not only his untiring industry, but also high talent ; also a work on equine pathology by the Messrs. Gresswell, which is well worth the perusal of veterinarians.

During the last few months a disease has been witnessed amongst horses, both in England and Scotland, resembling what is known in India as the Loodianah Disease, one of the forms of Anthrax, and attributed to "locality," "emanations from the soil," impure water, heat of weather, etc. Now, gentlemen, I consider that those cases of it seen in this country are most interesting, and that they throw light upon the manner a cause of disease may be conveyed from one country to another very far apart.

All the cases of the disease witnessed in Liverpool, in March last, by myself, and by Professor M'Call in Glasgow and neighbourhood, had been fed on what is termed "Indian mutters" (a sample of which I now hand round), a species of the pea family, imported into Glasgow as ballast in ships from Indian ports, and used as food for horses. The symptoms were those of great muscular debility, roaring, hæmorrhage from the nostrils, terminating in some cases in sudden death. Others, however, continued to live for several months, but were incurable roarers, and had to be destroyed.

On a *post-mortem* examination of the acute cases, exudations of yellow-coloured lymph, with extravasation of blood into the muscles of the larynx lung tissue, kidneys, sub-lumbar fat, etc., were found.

Microscopically examined, the exudates and extravasates were found to abound in bacilli. On making cultivations it was found that the same organisms could be obtained from the dust with which the Indian mutters were covered, and particularly from the dried excreta of some rodent—probably a rat—which was present in some quantity. I look upon this discovery as an important one, as Loodianah Disease, as occurring in India, may yet be traced to tainted food. That these organisms were the cause of the disease is, I think, beyond doubt ; and that they were in the dust and excreta, and not in the peas, is also beyond doubt ; for I failed to cultivate them, although very numerous experiments were made from the peas themselves, after they were thoroughly washed and cleansed from all impurities. This conclusion is supported by a fact that occurred recently in Edinburgh, where, acting on the advice of Mr. Rutherford, parties who were using this food had it well boiled before giving it to the horses ; no bad results followed. Now, if the deleterious agent were some alkaloid or other poisonous material contained in the grain, similar to that of the *Lathyrus sativa*, mere cooking would not have destroyed it, although it was quite sufficient to destroy the organisms.

Having now briefly referred to matters which may be looked upon as satisfactory and beneficial to our body generally, I have to say a few words upon others having a converse aspect.

In the first place, an attempt has been made, and which seems to me, if not resisted, to be calculated to destroy the individuality and independence of the profession, by converting its members into mere dispensers of medicines and disposers of empirical remedies, and that attempt has been made by no less a body than the Royal Agricultural Society of England, aided and abetted by Professor Brown, who, you are aware, is the chief Veterinary Inspector to the Privy Council, and Professor of Cattle Pathology at the Royal Veterinary College, London. Professor Brown, I may state, has issued a pamphlet—under the patronage of the Agricultural Society—containing all directions by which farmers and others can doctor their own horses and cattle ; and he and the Society have done more than that. They have appointed veterinary surgeons, in almost every county in England and Wales, to have the extreme privilege of compounding and selling the medicines prescribed by Professor Brown. Now, gentlemen, I have hitherto been under the impression that the value of a veterinary surgeon consisted in his diagnostic skill, and in his ability to treat his cases in accordance with a correct diagnosis ; but in this scheme diagnosis goes for nothing, and the veterinarian is simply reduced to the dispensing chemist—nay, indeed, to the seller of quack nostrums ; for I cannot look upon any prescription, unless given after the examination of the patient, otherwise than a quack one.

Even if the pamphlet itself were not calculated to injure our profession, by taking the bread out of their mouths, the conferring of what the society supposes to be a privilege to some one man in each county is a gross injustice to others, and is the means of preventing personal enterprise. I am sorry to see the names of many well-known veterinarians amongst those who have accepted these posts of dispensers of drugs for the society and Professor Brown. Some of these gentlemen, I am sorry to say, are members of Council, some Examiners, but chief among them we have the Royal Veterinary College, London, appointed to act for the Metropolis and Middlesex.

If the pamphlet and the appointments are to be deplored, the apologies advanced in support of them are more deplorable still. At the last meeting of the Council, where this subject was brought under discussion, we had the privilege of listening to Professor Axe; and, gentlemen, ponder a moment over what he said: "They—the profession—were endeavouring to put a stumbling-block in the way of education, so far as the agriculturist was concerned ; but it did not occur to them that the agriculturist might just as well complain of the instruction given in the agricultural journals to the many veterinary surgeons pursuing the occupation of farming."

I have, in the next place, to refer to what you are all more or less aware of, viz., that within the last three years a great change has come over the opinion of some of the profession as to the relative values of a scientific or a practical training of our students. Whilst I hold that it is impossible for any one to be too well acquainted with the practical details of his profession—and agreeing, as I do, that many men have gone forth into the world with the diploma of the profession without possessing the necessary practical knowledge—I will not admit that the veterinary is worse off than any other profession, even in this respect; and if we look around us, and see how many have succeeded in practice—nay, indeed, are now successful—we shall be forced to conclude that this cry for practical perfection has no legitimate foundation.

The time has been when our students obtained credit at their examinations when teachers were complimented by professors at universities—men of

world-wide reputation, who then acted as Examiners—upon the great excellence of the knowledge possessed by the candidates who had been before them. All this is altered now ; a credit mark is scarcely ever obtained at the final, or C, examination, and the great majority of men are absolutely rejected. I need not tell you that dissatisfaction has been expressed at this, and some correspondence has taken place in our periodicals. Fault has been found with some of the schools for speaking out their minds upon the matter. I need not dwell upon this. The schools, so far as I am aware, simply desire that the well-known rule and modern practice in the examinations of students of the medical and other professions be carried out—namely, that the Examining Board should have a mode of dealing with the examinations which will enable the schools to teach up to a fixed standard, and admit or reject according to a fixed percentage of marks, and not by the fads (the term is not my own) or caprices which are common even among experienced practitioners, and which students cannot be expected, and are not taught, to become familiar with.

In a leader in the January number of the VETERINARY JOURNAL, Dr. Fleming, while expressing a very laudable desire to elevate the profession, instead of arguing the question so as the public or the profession might have an opportunity of judging for themselves, simply takes to scolding the teachers and others who have the audacity to differ from him.* This mode of dealing with the question will neither satisfy nor elevate the profession ; the party or parties who are to decide must be in a position to take a dispassionate view of both sides of the questions recently raised—to the best mode of teaching the students to a certain standard of required proficiency, and fixing the standard of percentage for admission on an admitted and known principle, and not on exceptional opinions, however honestly held by individual Examiners.

With the view of altering the present state of matters, and having in view the great pressure of the work of the Examiners—a pressure which is increasing every year—the Principals of the four veterinary colleges agreed that the Examining Board should be strengthened by an addition to its number of at least four Examiners to act upon the final, or C, examination. This resolution was brought forward at a meeting of Council in October last, and carried by a large majority. It was proposed by Professor M'Cail, and seconded by Professor Robertson ; but, unfortunately, owing to a slight informality, the question had to be reopened at the meeting of Council last month (January), and was defeated by a large majority; Professor Robertson, who had seconded it in October, and had all along expressed his strong approval of it, not only speaking, but voting against the motion, and in a most patronising manner saying he had supported it at the previous meeting in deference to the opinions of his friends from the North. Most probably Mr. Robertson has some cogent reasons for stultifying himself. To me, however, his conduct seems incomprehensible. In conclusion, I have just to notice that the questions referred to in the foregoing remarks, as well as others of considerable importance, have been discussed—mostly by anonymous writers—in the pages of the VETERINARY JOURNAL ; but in such terms and temper which put an end to any good results. For when parties arrogate to themselves a superiority of judgment which refuses to recognise their own defects, or the other side of a question, and resort to a bellicose and spasmodic style of composition that results in personalities, it is better to pass them unnoticed than to descend into an intemperate arena from which no good can come forth ; for neither the profession nor the public can be benefited by

* This statement is not correct. Dr. Fleming did not write the leader in the January Number of the JOURNAL, as any one may see by referring to pages 29 and 31.—ED. V.J.

the tactics of such parties, notwithstanding their oft-repeated assertions and pretensions.

Professor Williams exhibited a number of cultivations of the micrococcus of Pleuro-pneumonia prepared by Dr. Woodhead.

Principal WALLEY endorsed what had been said by the Chairman, both as regards the progress of the veterinary profession and the examination of students. He was very much disappointed with the direction matters had taken professionally in the sister-country of late. He earnestly hoped that before other twelve months had passed, better feeling would exist between them and their English brethren, and that they be found working together in perfect harmony (applause).

At the dinner, which immediately followed the business meeting, Professor Williams presided.

The usual loyal and patriotic toasts having been duly honoured, Mr. CUNNINGHAM proposed "The Royal College of Veterinary Surgeons," and, in a lengthened speech, referred to the conduct of their English brethren, stating that, though none had a greater respect and admiration for that institution at one time than he, still, as at present constituted, he could not say he admired it. He alluded to the meagre representation of Scotland on the Council and Examining Board, and said they would never get things placed on a proper footing till they had a new and popular system of election (applause).

The CHAIRMAN, in replying to the toast, impressed upon them the importance of ascertaining the views of candidates for the Council, and of electing only those who were sound on those matters which closely affected the welfare of the profession; for at present the Council was under the influence of two or three men. He trusted the Examining Board would soon be largely recruited by men from the North, and that great satisfaction would be afforded the sons of Scotland, so many of whom were annually examined under that Board (applause).

Dr. WOODHEAD proposed "The Scottish Metropolitan Veterinary Medical Society," which was responded to by the CHAIRMAN, who referred to the influence of such societies upon the progress and welfare of the profession.

The toasts which followed, included "Kindred Societies," "The Retiring President," "Highland and Agricultural Society," "The Secretary," and "The Visitors."

T. H. LEWIS, *Hon. Secretary.*

Obituary.

THE death is reported of W. Phelan, M.R.C.V.S., Clogheen, Ireland, who graduated in 1876.

The Dean of the Royal Veterinary Institute of Vienna, and, perhaps, the oldest member of the profession, Dr. Veith, has recently died at the venerable age of ninety-seven years. A very distinguished veterinarian in his day, and a voluminous writer, he will be best known by his "Handbuch der Gerichtlichen Thierarzneikunde," and for his edition of Emanuel's "Handbuch der Veterinarkunde." He retired from teaching in 1855.

Army Veterinary Department.

Gazette, March 10th.

Inspecting Veterinary Surgeon W. B. Walters to have the local rank of Principal Veterinary Surgeon whilst employed as Principal Veterinary Surgeon in Egypt. Dated February 19th.

Gazette, March 17th.

The following Veterinary Surgeons on probation to be Veterinary Surgeons:—T. Marriott, H. A. Fullam, H. T. Pease, C. H. Betser, G. H. Evans, E. R. C. Butler.

Veterinary Surgeons Marriott, Fowler, Butler, Evans (G. H.), Fullam, and Pease have embarked for a tour of service in India.

The following additional veterinary officers have embarked for service in the Soudan:—Baldock, Taylor, Gladstone, Gillard, and Haslam. At the battle of Hasheen, fought near Suakin, on March 20, Mr. Baldock, who was preventing riderless horses from reaching the enemy, narrowly escaped being speared by a party of Arabs, who rushed at him.

Veterinary Surgeon Matthews has returned from India, and is posted to the Royal Horse Guards (Blues), in place of M. J. Harpley, retired.

Veterinary Surgeons Short and Twiss have arrived in England from India, on sick leave.

At the Levée held at St. James's Palace on March 2nd, First Class Veterinary Surgeons Rostron, 2nd Life Guards, and Walker, 1st Life Guards, were presented by Viscount Templetown, K.C.B.; and at the Levée held on March 14th, Inspecting Veterinary Surgeon Gudgin and First Class Veterinary Surgeon Cheesman were presented by the Adjutant-General.

Notes and News.

COMMUNICATION OF TUBERCULOSIS BY VACCINATION.—Since Jenner's discovery, the question of the transmissibility of Tuberculosis by vaccine lymph has been much discussed, and differently interpreted. The researches of Villemin and Koch, which have furnished good reason for believing that Tuberculosis is virulent, render the question still more important. In 1881, M. Toussaint, in a note communicated to the Académie des Sciences, stated that he vaccinated a phthisical cow from a healthy child; he afterwards inoculated a pig and a rabbit from the vaccine pustules of the phthisical cow, and both animals were attacked with Tuberculosis. Koch's bacillus was not found in the lymph. M. Strauss has repeated these experiments. In the space of eighteen months, five phthisical patients were revaccinated. Ehrlich's process failed to reveal bacilli in the vaccine lymph of these patients. Inoculations from the vaccine lymph of phthisical patients were effected in the anterior chamber of the eye of rabbits, but they remained exempt from Tuberculosis; a few days after the operation, the eyes were completely normal. The necropsy was made a few days subsequently, but there was not the slightest indication of Tuberculosis. M. Josseren, a pupil of M. Chauveau, made the same experiments as those of M. Strauss; they were equally negative in result, and indicate that Tuberculosis is not transmissible; thus, twenty-four facts oppose one furnished by M. Toussaint.

FOWL-DIPHTHERIA.—Fowl-diphtheria, a disease which has been studied in Germany by Dr. Klebs, has been prevalent this winter in Cairo. It is characterised by copious patches of membrane in the mouth and throat, swelling and ulceration of the neck, and inflammation of the intestines, with abscesses round the anus. Dr. Brugsch has been studying the disease microscopically, and by cultivation-experiments at the Khedivial laboratory, which he has fitted up with the cultivation-apparatus which is used in Dr. Koch's laboratory. He has found in the membrane, and in the œsophagus, a bacillus resembling that found by Dr. Loeffler in the diphtheria of pigeons; but he has not yet found it in the other organs, nor has he succeeded in inoculating other animals with it.

MEDICINE AS PRACTISED BY ANIMALS.—Mr. G. Delaunay, in a recent communication to the Biological Society, observed that medicine, as practised by animals, is thoroughly empirical; but the same may be said of that practised by inferior human races, or, in other words, by the majority of the human species. Animals instinctively choose such food as is best suited to them. A large number wash themselves and bathe, as elephants, stags, birds, and ants. In fact, man may take a lesson in hygiene from the lower animals. Animals get rid of their parasites by using dust, mud, clay, etc. Those suffering from fever restrict their diet, keep quiet, seek dark and airy places, drink water, and sometimes plunge into it. When a dog has lost its appetite it eats that species of grass known as dog's grass (*chien dent*), which acts as emetic and purgative. Cats also eat grass. Sheep and cows, when ill, seek out certain herbs. An animal suffering from Chronic Rheumatism always keeps as far as possible in the sun. The warrior-ants have regularly organised ambulances. Latreille cut the antennæ of the ant, and other ants came and covered the wounded part with a transparent fluid secreted from their mouths. If a chimpanzee be wounded, it stops the bleeding by placing its hand on the wound, or dressing it with leaves and grass. When an animal has a wounded leg or arm hanging on, it completes the amputation by means of its teeth. A dog, on being stung in the muzzle by a viper, was observed to plunge its head repeatedly for several days into running water. This animal eventually recovered. A sporting dog was run over by a carriage. During three weeks in winter it remained lying in a brook, where its food was taken to it. The animal recovered. A terrier hurt its right eye. It remained lying under a counter, avoiding light and heat, although it habitually kept close to the fire. It adopted a general treatment, rest and abstinence from food. The local treatment consisted in licking the upper surface of the paw, which it applied to the wounded eye, again licking the paw when it became dry. Animals suffering from Traumatic Fever treat themselves by the continued application of cold, which M. Delaunay considers to be more certain than any of the other methods. In view of these interesting facts, we are, he thinks, forced to admit that hygiene and therapeutics, as practised by animals, may, in the interest of psychology, be studied with advantage. He could go even further, and say that veterinary medicine, and perhaps human medicine, could gather from them useful indications, precisely because they are prompted by instinct, which are efficacious in the preservation or restoration of health.

Correspondence.

THE RELATIVE VALUE OF SUBJECTS TAUGHT THE VETERINARY STUDENT.

SIR,—Now that Mr. Greaves has completed his essay on veterinary education, we are able to consider his opinions as a whole. The title of his paper suggested a careful, judicial summary of the value of anatomy, physiology, chemistry, pathology, etc. I confess to have had a feeling of some curiosity as to how he would accomplish his task, but I did not expect such a bold result as has followed. Not many men possess the natural and acquired talents requisite for profitably discussing the relative value of subjects taught the veterinary student. In attempting such a task Mr. Greaves exhibited great courage. As far as I can see, his only fitness for it consisted in the possession of "good intentions," and in having made for fifty years "his special business his life's work." Under these circumstances it was a wise discretion which prompted him to make his performance very different from his promise. On his first page he promised to "try and concentrate our thoughts on the uses and importance of the various subjects taught, and appraise them at their actual relative value." Throughout his future pages he fails to discuss any one of them, but treats them collectively, under a crude division into two classes—theoretical and practical. Even this apparently simple issue Mr. Greaves finds too much for logical and fair discussion. He attempts it by painting two gross caricatures—one a human ass; the other, of course, a prodigy, inclining to the goody-goody young man. The peculiar mental confusion of the essayist is, however, clearly shown by a few words in his comparison on page 398: "Every scientific subject, none of which subjects seems (*sic*) to be of the same value or importance as tact and business habits." Now, sir, what in the world has tact and business habits to do with the value of subjects taught the veterinary student? How can these quite extraneous matters be logically brought into a comparison of the value of theoretical and practical teaching? We are told the Examiners are over-worked, and that insufficient time is given to each student. How would it be if tact and business habits formed part of the test applied to a candidate for the diploma? No one denies the value of such characteristics, but where are we to draw the line? Morality, temper, health, and a dozen other matters are equally valuable. If we do not limit the test to strictly professional subjects, we simply render it impracticable.

The utter incapacity of Mr. Greaves to understand the duties of teachers, the limits of the body-corporate's powers, and the falsity of the standard of success in life, renders his whole paper useless. He fails to see the end which it is wished to attain, and he knows very little about the means for attaining it. He discusses many debateable matters, but none which properly come within the title of his paper. There is a remarkable similarity in Mr. Greaves' literary productions. The plan seems to be something of this kind:—First, an invocation to calm, philosophic reasoning, a gentle deprecation of haste or temper, a reference to the Deity, and a few lines of poetry; then he warms to his work, forgets the title of his paper, wanders from the subject, draws upon his imagination for facts, abuses those whom he cannot confute, and winds up by begging the question. It is very difficult to argue with a writer of this kind, and especially difficult when his grammar and composition are so involved as to make many of his sentences unintelligible.

If I have understood him aright, Mr. Greaves says that when students went to college two sessions, they came out good practitioners; but now that

they go for three, they are of very little use; and he draws the inference that the longer you stop at college, the worse you become. He demands that both teaching and examining shall be efficient, which implies that they are not. He tells us that there is now a greater percentage of rejected students than was ever known; but he does not tell us that most of them have been pupils. He sketches for us a model Examiner, and the unconscious humour of the picture induces me to reproduce it:—"In the Examiner there must be an absence of austere, pedantic, or frivolous manners; he must assume none but a business-like air. He should be an enlightened, intelligent man—a man of mature age and experience, considerate, patient, mild, benevolent, keenly observant, and firm; one who puts his questions carefully, clearly, coolly, and kindly, so as to be fully understood; and one who weighs the answers justly, who puts the student at his ease through his own apparent complaisancy. Though unseen, there is in him intentness of attention." This is grand—Emerson and Carlyle combined, only rather more so. Have we such a man? Does any one recognize the portrait? The danger lies in over-doing it; and, by way of caution, I would remind the Council of an old adage which says, "The gravest bird is an owl, the gravest beast is an ass, and the gravest man is a fool." How shall we identify and avoid the superlative-gravity Examiner.

If Mr. Greaves' statements were facts, the logical deductions to be drawn from his paper would be—

1st. Adopt a pupilage clause.

2nd. Teach less science.

3rd. Appoint Mr. Greaves an Examiner.

But his premises are false, and, therefore, these deductions must be false. He seems to feel this himself; and, on page 176, he says, "I am in favour of pupilage, but not compulsory pupilage." How are we to reconcile this statement with the whole tenor of the essay? On page 312, I find "It is important that the student shall acquire full knowledge of each and all the subjects now taught at college"; and yet on every other page is a sneer at all things scientific. The third deduction I do not consider worth discussion.

Mr. Greaves makes one suggestion which should not be lost. No one is better qualified to carry it out than himself, but we can all help. It is this:—"It would be wise for us to put into a practical and definite shape some scheme elaborated out of the principles, characteristics, and qualifications possessed by a successful man." Emboldened by another remark of our essayist, "That to give good advice implies no capacity to follow it,' I venture to offer a few tactical hints, which I am told are not altogether unworthy of notice:—

Never hesitate. Always do something or give something.

Disguise your ignorance when you cannot display skill.

Agree with your client's diagnosis—it flatters him, and does no harm.

In treating a case never forget your ledger.

The majority of men will accept cheques; others will take coin.

Rise early, and always profess to be very busy.

Attend church, and, if possible, become a vestryman.

If the profession be really in the bad way indicated by Mr. Greaves, and by the deputy who wrote the milk-and-water leaders during the illness of the Editor, the Council should see to it. Only a formal inquiry can elicit the facts. Possibly a special general meeting might be advisable. Certainly no individual is in a position to say what is wrong, and where.

London. WILLIAM HUNTING.

SIR,—It would have been far more in consonance with my feelings to have abstained entirely from taking part in the discussion of the above subject; nor, to the ordinary mind, open to rational conviction, should it be at all necessary, after the very able letters of Mr. Penberthy and Mr. Shave; letters which, so far as they relate to the discussion, are literally true, containing not the slightest approach to exaggeration, for which I can vouch on *practical* experience.

Mr. Shave, in his communication to the February number of the VETERINARY JOURNAL, says: "Those young members of the profession who, like myself, have reaped considerable benefit from the College practice, will hardly be doing their duty to their *alma mater* if they do not add their testimony in confirmation of my statements," etc., etc. In reply to this challenge, which I think is a perfectly reasonable one, I take up my pen; and I may add I consider it to be the least that any graduate of the London school can do, who received, as I did, every needful assistance and encouragement from the teachers while studying there, especially as the efficiency of the teaching arrangements is being assailed; and, moreover, it is inferred, if not absolutely affirmed, that the opportunities for obtaining the necessary knowledge of and acquaintance with the practical details of the veterinary profession, are altogether inadequate to the requirements of the present day.

I am sorry to appear to be entering the lists against one of my Lancashire friends; but it seems to me that Mr. Greaves is, as to his facts, making many statements that he cannot substantiate; and when advancing his opinion as to advisability of a certain course of procedure under such and such circumstances, that he is either wide of the mark or behind the times. Of one thing I feel certain: however much I and others may differ on this subject from Mr. Greaves, I believe him to be actuated solely by an overpowering desire to benefit the veterinary profession.

I cannot expect you, sir, to afford me space for a letter of sufficient length o deal exhaustively with Mr. Greaves's numerous and various premises, hence I can only pretend to touch the fringe of the argument, and briefly state a few facts based on my own personal knowledge.

One of the chief matters about which Mr. Greaves's mind seems so exercised, is the fact that at a certain final examination a much larger proportion of students than usual were relegated to their studies, and Mr. Greaves asks, How is it? Well, without pretending to answer the question, not knowing either the men who presented themselves, or anything of their individual qualifications, I may perhaps be permitted to give it as my opinion that an isolated instance of this sort need not cause Mr. Greaves to quake for the honour of the profession, nor is he, in my judgment, justified on this account in condemning wholesale the system or success of the teaching conducted at the London school—for it is of this school only that I can offer an opinion; but from what I know of Professor Williams and Professor Walley, I doubt not they do all in their power to assist those students who enter their respective colleges, that they may turn out as well qualified to practise as men can be reasonably expected to be at the age of twenty-one years or so. Mr. Greaves must not expect young men of this age, whatever may be their mental calibre, to possess the ripe experience which it has taken him fifty years to obtain.

Mr. Greaves will perhaps say that he has come in contact with a number of young men who are deficient—may be lamentably deficient—in a knowledge of many very simple matters connected with their profession. Granted; but without any intention to wound the feelings of any such unfortunate gentlemen—provided they are to be found—I must express the opinion that the fault, if they are graduates of the London school, is with themselves: either they have

failed to avail of the opportunities within their reach, or they have no aptitude for their profession, and have mistaken their avocation.

Mr. Greaves seems to be under the impression that a practical acquaintance with the details of the profession cannot be obtained at the schools; and here, so far as London is concerned, I must tell him point-blank he is entirely mistaken.

Such opportunities, and that in all their minutiæ, are available to any and all earnest students, provided they have received such an education as fits them to undertake the study of a profession based on scientific principles, and such as do not present themselves in any private practice in the country. I need not reiterate these advantages, they are all clearly and definitely pointed out in the letters of Mr. Penberthy and Mr. Shave before referred to. I may, however, tell Mr. Greaves that such operations as castration, neurotomy, removal of tumours large and small, some requiring careful dissection and the frequent taking up and ligaturing of blood-vessels, while others were removed with the ecraseur, all alike calling for delicacy of manipulation; further, the application of the actual cautery in various cases of lameness; operations on extremely bad cases of Poll Evil and Quittor were repeatedly performed by myself on animals which were brought to what is known at the Royal Veterinary College as "*Cheap Practice*"—subject, of course, to the oversight of one of the Professors; and no better practice than this can an industrious student require, both as regards the number and diversified character of the cases coming for treatment on three afternoons of the week. Then, these are quite apart from and irrespective of a large number of patients that are brought by subscribers to the school infirmary, among which cases can be studied daily under the supervision of the Professor in charge, as well by private observation for as long a time as the student may desire, except such cases as those of Tetanus, requiring perfect quiet for the patient's benefit.

Operations of special interest, such as lithotomy, tenotomy, and the reduction of fractures, I had the opportunity of not only observing, but assisting in; also in the removal of that form of tumour known as Fungus Hæmatodes. I mention these as a few only among the many opportunities of obtaining practical experience that came within my reach for the mere seeking; and I can assure Mr. Greaves that similar advantages were open to all qualified to avail of them, who may have entertained serious intention of work; and I doubt not that so long as the present staff of professors and teachers retain their respective positions at the Royal Veterinary College, the same privileges will be available.

Then with respect to the examination of horses as to soundness, animals of all sorts, conditions, and classes are brought before Professor Robertson, Professor Axe, and Mr. Penberthy, and at the hands of these gentlemen undergo the most careful scrutiny. Any students who wish may be present meanwhile, and more often than not the examiner of the horse takes this opportunity of explaining defects, directing attention to specially good points in contour and anatomical development, and of requesting students to give expression to their opinions respecting the animal's soundness or otherwise; further, not at all unfrequently I have known Professor Axe request a certain number of students to examine one or more horses, write out certificates, and hand them in for correction or approval. Now if this sort of thing does not satisfy Mr. Greaves, so far as the efforts of the teachers are concerned, it is somewhat difficult to imagine what would come up to the standard of this gentleman's requirements.

Mr. Greaves would seem to be an out-and-out advocate of the pupilage system. The discussion of this subject in all its bearings would require reams of paper, and though books without number were written thereupon,

I doubt whether the most able *littérateur* could convince Mr. Greaves of the inadvisability of this system. I may give it as my opinion that there is much to be said on both sides of the question, and very plausible arguments can be advanced by the advocate of either side, but on the whole, after weighing the *pros* and *cons* very carefully, in conjunction with a close observation of the demeanour and success of those young men who were at the College with myself, and who had served a two or three years' apprenticeship, I have arrived at the conclusion that the pupilage system does more harm than good, unless a student went for a given period with a conscientious practitioner after passing his "B," or second examination; at which time he should be qualified to undertake the reading of works on pathology during his spare hours, and thus be able to intelligently compare the practice of his principal with what he may observe and what he finds in the text-books which are to be his guide in preparing for his final examination. Anything that may be learned with a veterinary surgeon before this period cannot certainly be other than knowledge gained by rule-of-thumb, without any proper appreciation of why and wherefore. Such an arrangement, however, I presume could hardly be carried out unless the schools altered their conditions of entry; the fact, nevertheless, remains the same.

No one can more sincerely regret than myself that so large a proportion of the candidates who present themselves for examination fail; that is, however, no reason why the onus of failure should be put upon the wrong shoulders; and I venture to suggest that before Mr. Greaves writes more upon this and kindred subjects, it would be as well that he should make himself better acquainted with facts as they are to-day; and from what I know of him I have no doubt that, having done so, he will honourably retract many of the remarks that he has made which are so derogatory to the acknowledged usefulness of the schools. There is one point which appears to weigh very heavily on Mr. Greaves's mind, and that is the lack of experience in practical knowledge on the part of young graduates. Let me ask what is the meaning of this word practical or practice? If I appreciate it rightly, it is the evident carrying out by dexterous manipulation of the theories we find propounded in standard works; hence a man must have a certain knowledge of theory before he can pretend to practise—in point of fact, theory and practice are handmaidens; the one is nothing without the other. Therefore I do beg that Mr. Greaves will in the future demand less urgently for practical men until the said young men have had a fair opportunity of obtaining that proficiency in practice that Mr. Greaves so yearns they should possess. You cannot put an old head on to young shoulders, nor would the phenomenon be desirable if you could; let the young man's mind be properly trained, and if he is at all fit for the work of our profession, a knowledge of practical details over and above what he can obtain at the college will rapidly follow.

I cannot believe for one moment that the failure on the part of undergraduates to pass their final examination which Mr. Greaves deplores, is altogether the fault of the men either. I am decidedly of opinion that with some of the examiners there is a decided tendency, if a candidate is found weak on any given subject, to keep pegging away at that same subject until the man is fairly driven to his wits' end; again, another looks you in the face and opens out his questions very much as a defendant's counsel cross-examines the plaintiff's witness, and may at the same time give a filip of sarcasm to any remarks he may think it necessary to offer upon a candidate's answers. Both these modes are in my judgment a mistake; the examiner, to do his work fairly, should inspire the candidate with confidence, and if weak on any given subject should fall back on another, and yet another, in order to discover how much the man really does know, and not how little he

is acquainted with any given subject. Many, perhaps most of the examiners adopt such a fair course, as I can testify by experience, but some do not, and as one is quite able to have a man rejected, I would ask Mr. Greaves whether he thinks this has anything to do with the failures he refers to.

The sum of the whole matter, so far as the London school is concerned, is that the student has far better opportunities and higher privileges than Mr. Greaves seems to be aware of, and it is this I wish to impress upon my Manchester friend.

J. SUTCLIFFE HURNDALL, M.R.C.V.S.

254, Upper Parliament Street, Liverpool.

SIR,—On re-perusing the replies (to my papers) of Messrs. Penberthy and Shave in the VETERINARY JOURNAL, from amongst many distorted extracts I find some matters so pertinent to my subject, that I think they may be referred to with some, if not much, advantage. In the first place, I trust neither these gentlemen nor any one else will be misled by constructions they put on a passage of mine about pupilage, or indenture of apprenticeship, to stand in lieu of, or in the place of, examination on practical subjects—frivolous criticisms, not creditable to their wisdom nor their sagacity. I never intended anything of the kind. I should have the examination just as thorough and as searching as if the student had not an indenture. I look upon it that the student, being in possession of an indenture showing that he had served three years with a general practitioner, would assist the examiner to arrive at certain conclusions more correctly and more satisfactorily as to the extent of the student's experience. I have assisted at the election of every examiner for twenty years. With a few exceptions, I know they are incapable of doing students an injustice. But I repeat they have to vouch for much they know not. But, perhaps, some may object, and say, "Why do you, who were gaining experience in your profession probably many years before even their mothers were born, try swords with these two, whose experience in their profession is of such a short and brief duration?" I do not want to complain, or charge these two young men with wilfully and intentionally perverting my meaning in many passages which would have been less indecorous and much more honourable of them to have left uncommented upon. But I will pass this, and refer to matters in their papers worthy of mental effort of the ablest men in the profession. I will at once discuss the question of the difference between college pupilage and the pupilage at a general practitioner's establishment. This will lead us to the heart, or the very kernel, of the matter in dispute.

The difference between Pupilage at College and Pupilage with a General Practitioner.

I have heard much laudation of advantages the students have offered them at the Royal Veterinary College. Now, I am not for one moment going to find fault, or detract from the positions advanced; nor will I, in the slightest degree, insinuate that any one of the teachers is deficient in knowledge, in education, or in diligent attention to his duties. Whether there are shortcomings or not, I believe the system is wrong; for, from some cause or other, there is a failure in results—an untrustworthiness in the results. I say the system is weak and has broken down. I am agreeable to give full credit to this fact, that there are some students who possess senses so obtuse that no teacher, however diligent and painstaking, can make clever. Still, there ought not to be, nor would there be, such gross failures as we are constantly meeting with, if at this and the other colleges the system was right and each teacher did his duties thoroughly. To say we are entering upon a brilliant

future would be a gross self-deceit to assert. The youth as he enters the V.S. establishment is several days before he feels his feet. He sees his master take a horse's pulse, give a horse a ball, other horses a drink; others he washes, and injects solution into quittors. This youth soon begins to take part in the work—holding the twitch, clipping legs for blistering or firing, etc.; he is shown how to go about a horse, to lay hold of a horse, to make a ball, and dress wounds; he goes out with his master, sees all kinds of cases and all that he does at them, and hears all instructions concerning cases; made to make memoranda, or keep a record of all cases of importance, together with a clear statement of the remedial measures used and results arrived at; he has certain modern books on his profession given him to read; it is his duty to see that the stock of medicine is always kept up; he is taught how to wrap up powders and bottles with tidiness and neatness; he must keep up the required stock of fever balls, cathartic balls, diuretic balls, also cow drinks, alterative powders, pots of blister ointment, digestive ointment, heel ointment, etc., etc.; keep the surgery, bottles, instruments, etc., clean and tidy; and see that all work done is correctly entered in the day-book, and the ordinary charges entered. These are all matters of his legitimate duties; there is no time for him to stand with his hands in his pockets, much less to have a cigar in his mouth. It is, and it has always been, my practice to get an eye, or heart, or larynx, dissect them, and explain them to the pupils. I write out twenty or thirty questions on anatomy, physiology, or pathology. I expect them returned, answered, in a month. This compels the pupils *to read* and *to think*. Then, occasionally, I have them in the room before me, and for one hour, or one hour and a half, question them on all kinds of diseases—causes, nature, symptoms, and treatment; also on the bones, muscles, and various vital organs. All this tends to instruct the pupil, and helps to advance him on the road to success. By these means he gradually acquires a fund of information invaluable to him in after-life. His master is continually pointing out to him matters in connection with cases. This attention is concentrated upon one pupil, who is obliged to devote his whole time, his whole mind and thought, to these subjects that are urged upon him; he is fully occupied in the work of the cases; he soon (if an intelligent lad) begins to take an interest in every case that comes upon the premises, and when his master is out he has to receive all messages and answer all inquiries. His master endeavours to make him understand the symptoms of different diseases; takes him with him to every *post-mortem*, and is careful to explain as much as the boy can understand, showing him the difference between diseased and healthy tissues. Thus time goes on for three years. Every day he sees and learns something, and he becomes more and more familiar with every kind of case; seems to know intuitively what is amiss; is at home in manipulating and treating them with ease; and occasionally—nay, frequently—he has to go through his facings. It puts him on his mettle. I will give an example or two. Once, in my absence, a pupil, about eighteen years of age, had to attend a severe case of abdominal pains. It was a protracted one. After giving various antispasmodics, stimulating abdomen, etc., he had recourse to bleeding. The owner—a big, blustering, austere, and very critical man—had him sent for into the office, and in an austere manner and tone said to him, "I am informed you have bled this horse; it would have been much better if you had put blood into him rather than have abstracted blood." The boy stood before him, without being self-assertive, and replied, "No, sir, I had done all I could without avail; it is a proof that I did right, for since bleeding he has become quite easy, and is now doing well." The owner then made answer, "Oh, if that is the case, it settles the question; I am glad you have done it." Now, that was acting on his own resources; it was a lesson in tact, and proper, success-

ful treatment in pathology, based on scientific principles (nor yet is it cant or trickery, as Mr. Penberthy has it), and, I hesitate not to say, was worth more to him than scores of lectures—some of them on subjects of, perhaps, almost worthless possession. Again, during my apprenticeship, in 1836, I was called out to see a new and valuable cart-horse; he was a big horse, and very plethoric. I found his breathing very much accelerated and pulse nearly 100. The owner was present; he was a man possessed of more than an average share of common sense, but withal he was a strict, austere, and critical man; he had only just come to us. Our predecessor bled almost every case; bleeding was then in full swing. The owner asked, "Shall you bleed him?" I replied, "No, sir, taking all into careful account, I think it is more excitement than congestion; we will see how he is in the morning." I, of course, gave medicine, etc. Next morning I saw him again, the owner present. "How do you find him?" he asked, in a firm but mild tone. I replied, "Not worse, sir, and only a shade better; pulse ninety-six." "Shall you bleed him?" again he asked. Now these are ticklish moments in a man's life, that find out what he is made of. This case was quite as likely to do badly as to do well; had the case done badly in the end, he would have blamed me for not bleeding, and I should have lost his confidence. I again answered, "No, sir; there is no absolute necessity for it; I am strong in my opinion that we shall find him better at noon and at night." The owner saw that I was thoughtful and careful, and he trusted me, although only a boy. At noon—breathing a little quieter, and pulse ninety—again I was asked, "Are you going to bleed him?" I replied, "No, he is going on favourably." At night still improving, he went on all right. That customer was the largest and best one we had, and he has employed me ever since. Mr. Penberthy characterises me an impostor for doing this work. It is these cases of individual responsibility, realities of actual practice, that leave a lasting impression; they are lessons in life—in tact—which are never taught or experienced at college. I say the youth should be an expert practitioner before he enters the portals of such an edifice; hence the two different modes of pupilage. There should be no diverse or competing interest in this instruction. I could give any number of cases similar to the above, all going to show the difference, or disparity, between the two methods; for, after all, it is in the public arena where the final and last verdict is given—the ultimate arbiter; there the great Board of Examiners sit. At the general practitioner's, the pupil is an active agent; he becomes part and parcel of the establishment. Most of them are, of necessity, moulded into smart, sharp business men. They gradually assume a responsibility, and have responsibllity placed upon them, which forces them to feel a special interest in every case. This unconsciously gets them into business habits, handy in their work, and prepares their minds for college. They can now diagnose disease and lameness with almost certainty, and can treat them correctly; but, forsooth, Mr. Penberthy says they are merely impostors. Go into a veterinary surgeon's establishment; you see the pupil stripped, his shirt-sleeves rolled up above the elbows; he is standing on a bucket or a stool; he has a brush in his hand, scrubbing away with a will on a horse affected with mange. His master is superintending the whole time, from beginning to end. He, too, is in his shirt-sleeves, rubbing on the soap, and lading on the hot water, the master showing him how to rub, and where to rub, telling him particularly that it is of very great importance that every inch of the ground must be thoroughly gone over—viz., washed, wiped dry, and then dressed. But I may be trying the patience of some of my readers, who are ready to say, "Surely, Mr. Greaves does not mean that we pupils should mess with dirty, filthy cases of Mange; we are learning the pathology of a scientific profession; it is *infra dig.* to expect it. It is the work of the groom or stableman." These sort of gentlemen

would delegate many of their duties requiring industry to some one else. I would here observe to such that these notions put you above your work; this work is simply your actual duty. You may think it is supporting your dignity, but I say it is supporting false pride and laziness. If you leave this work to the care of the groom or stableman, it is just fifty to one that you never cure a case of true Mange in your life. The skin is never half cleaned; you will be tinkering on week after week without improvement; the owner's patience becomes exhausted, and he sends for another veterinary surgeon, who does the work himself, and it soon recovers. These false notions may have been implanted in his mind at some institution, but never in a veterinary establishment. Perhaps this refined, scientific pupil could show you, with the microscope, the Mange acaris, and expatiate in scientific terms, being perhaps fond of controversial rhetoric; but the result of his method of scientific pathology is certain to end in rejection, in failure, and in poverty; it is illusive and unsatisfactory. Have we not been told over and over again by three or four professors, sometimes even in public, that the youth who has seen practice is conceited, and makes the worst student? Notwithstanding, Mr. Penberthy, in his innocence, very properly calls them sweeping, senseless assertions. During my limited experience I have never found this statement true.

I can say, in my own case, when I got to college, I listened with the keenest interest on every subject, all matters I had read on, and was now yearning to hear them explained to me. I have a clear and distinct recollection at this very hour of Professor Spooner, at the request of, I believe, Mr. Kenna, of Belfast, giving a demonstration in the afternoon of the day of opening, 1839, on the phenomenon of rumination, and the actions of each division of the stomach of ruminants. I can never forget the clearness with which everything was shown us, nor can I ever forget the intense delight I experienced while I was drinking in the words of wisdom he was speaking. Afterwards I went into the dissecting-room. A solitary student was there; he was on his knees, examining the bones of the fore-limb of the skeleton. I approached him, and made his acquaintance. We were fast friends from that moment. He was a practical student like myself; we had our minds whetted, and were downright hungry for more knowledge; we could not afford to lose a single lecture on any subject; we felt hungry for the knowledge college could give. The true value and place of the sciences appertaining to our art had become manifest to us. I trust we were not conceited. We could observe many others who had not had their minds, their genius, their capacity, awakened by having seen the intensely interesting cases of the ravages of disease in our domestic animals. We could see these men sprucely dressed, and wholly indifferent in any efforts of theirs to obtain knowledge but what was thrust upon them by their teachers; and very often they were seen shirking the lectures. A mere diploma is valueless; it is the knowledge and experience which a diploma should symbolise in which its value consists, and if he who owns a diploma lacks the knowledge and experience it sets forth, the owner is simply a *pretender* and an *impostor*. Not many months ago we were summoned to attend a horse said to be in a dying condition. A veterinary surgeon had seen the horse before we had been called in. He diagnosed the case a ruptured stomach; said it was utterly hopeless; would do nothing for him, and left him to die. This gentleman had been taught scientific pathology at college—yes, he had been taught sciences—and this was the untrustworthiness of the result. Neither my partner nor myself were in when sent for; so one of our pupils attended. He administered antispasmodic medicine, and with some trouble and management got the horse up; the pains subsided, and in a few days the horse was well and at work. But, forsooth, because this pupil's pathology was not based on scientific knowledge, he is an impostor,

according to Mr. Penberthy. But pray what would you call the other gentleman—I mean him whose pathological knowledge is based on scientific principles? A man is of no value except in so far as he is of use. But I must continue this at another time. T. GREAVES, F.R.C.V.S.

VETERINARY EDUCATION.

SIR,—Professor Walley, in his long letter in your last issue, has severely taken to heart the criticisms and suggestions which have recently appeared in your columns on the much-talked-of deficiencies in the practical education of our students. After broadly hinting, in his opening sentence, that he doubts whether the VETERINARY JOURNAL fulfils its object of improving the profession, he, in his second paragraph, says he would much rather have seen a discussion on some useful subject. What subject, however, can be of more importance to the public, the profession, and the student, than practical education? None; for without it a veterinary practitioner cannot give satisfaction. In his third paragraph, Professor Walley speaks of suggestions for a very much-needed reform as puerilities, and says one might be pardoned, while reading them, for imagining himself as living one or two hundred years ago, instead of in the nineteenth century. If, however, he were an Examiner, I fancy that very many of the answers given to simple practical questions might lead him to doubt whether he was not living even in the sixteenth century, and almost before the era of veterinary colleges. Then anonymous writers are castigated, and are charged as uttering "*vile slanders.*" In the sixth paragraph we have some almost pathetic reflections, which seem to indicate that Professor Walley has taken general criticism as a personal matter; and, finally, after previously denying that anonymous writers are entitled to be considered as gentlemen, he, in the tenth paragraph of his letter, says he is not going to imitate the example of throwing mud! Are we, then, to consider all the above amenities as rose-water? As to anonymous writers, your invariable rule is, I believe, that all letters intended for publication must have the name of the sender privately communicated to you, as a guarantee of good faith. Very many valuable opinions can be offered by those who would shrink from having their names published, some from dislike of fame or notoriety, others because they see that but too often fair criticism is made a personal matter. It is, therefore, permitted to earnestly hope that we may have the benefit of receiving all opinions in the VETERINARY JOURNAL, whether the writers choose to sign their names or not. It is freely admitted by the whole profession that a great reform in practical education is urgently required; in fact, no subject attracts such widespread interest and discussion. Mr. B. A. Clancy, who obtained first place for the last Fitzwygram prize, well expresses, in your number for March, the ideas of the students, and they are the class most to be benefited by reform. It is not sufficient to assert that opportunities are offered at the colleges for obtaining practical knowledge, and that students are to blame if they neglect them. What is more wisely said is that they should be compelled to learn indispensable subjects, and that shirkers should be taught that until they have demonstrated their fitness to the satisfaction of their teachers, they shall not be allowed to present themselves, and show their ignorance to the Examiners of the Royal College of Veterinary Surgeons. I would invite attention to a profound remark of Mr. Clancy, where he says that the veterinary surgeon must be acquainted with the points and shape of the various breeds and classes of horses, cattle, and sheep, and be able to converse with his clients on the merits and demerits of their studs. Now, can all this be learnt at any college? There is

another most important question which has not yet been answered. How is it, if professional matters can be entirely taught at college, that almost every newly-made veterinary surgeon who has not previously been a pupil to a private practitioner finds it necessary to go to one before he feels sufficiently confident to seek an appointment, or enter practice for himself, with any good chance of success. As long as we neglect practical matters, we are like the enthusiastic astronomical professor, who was so absorbed in pointing out the wonders of the stars that he and all his admiring students fell into the unperceived ditch at their feet.—Your obedient servant,

"EXPERIENTIA DOCET."

13th March, 1885.

"FELLOWSHIP;" THE NATIONAL VETERINARY MEDICAL SOCIETY, ETC.

SIR,—If your correspondent, Mr. Cunningham, would, in treating on the above subjects, use argument without sarcasm, and give facts without insinuations, his remarks would, I think, be read with more pleasure, and give less pain to individuals.

Fellows.—I have always understood it to be rather creditable than otherwise for a member of any profession to aim at taking the highest position that he can in it. To this Mr. Cunningham does not appear to agree; but it may safely be left to the good feeling and judgment of the profession generally to answer this for themselves. I, however, cannot help thinking that it is a misfortune that one who can so freely use his pen should put it to the purpose of throwing mud broadcast, with a hope that some of it may stick. I fail to see what good purpose Mr. C. hopes to serve by so freely bespattering us poor Fellows. Some of us, at least, were 'cute enough to "come early to the bridge that they may get easily over."

I was not before aware of the resignation of one of the Fellowship Examiners, but regret "that the excellence of some of the Fellowship candidates was not up to this Examiner's standard, and that sooner than pass or reject such men he resigned." I can scarcely believe, in spite of Mr. C.'s assertion, that any one in the position of an Examiner would so far fail to discharge his manifest duty as to decline to give his opinion for or against any candidate.

Mr. C. says: "The fact stands out broad and plain still, that in round numbers there are 100 Fellows and 1,900 members R.C.V.S., and that in 1886 Fellows only shall be eligible as Councillors and Examiners, and that this arbitrary decree deserves all the hard terms that can be applied to it." I hope this gentleman is alone in applying such "hard terms." What are the facts? The law as it stands was framed and sanctioned by a Council of Members. If the clause was so objectionable, why was it not objected to at the time? And after all, what is the cause of complaint? If Mr. Cunningham and his friends wish to occupy the position of Examiners and Councilmen—knowing the law, why did they not qualify themselves by becoming Fellows? Doubtless they could have done so under his "Class I.—men in attainments of well-known high standing," and left the "Class IV." men less numerous, namely, those who, "with considerable trepidation, or with confident, plausible exteriors, trusting that, as they are well known and very fair practitioners and most promising young fellows, whose general and professional knowledge is most satisfactory, and have come early to the bridge,—that they may get easily over." I would suggest that there is still time to qualify before 1886, and would like to know the reason why "a good, right-thinking, straightforward member will at all times make as good, and a *better*, Councilman and Examiner, than a possibly

more brilliant and accomplished, but, it may be, erratic, or on the other hand, *low* Fellow." Does Mr. C. forget that a Fellow is also a Member, and surely takes as much interest in the profession as before he took the higher degree? Or would he, as appears from his letters, consider the Fellowship as a disqualification from holding such office?

Mr. C. says he has nothing "against the Fellows personally," but he goes on to say: "When as Fellows they stand out as men of a higher order, *claiming* Council and Examining Board as their exclusive right, what just claim, in all reason, have they on their side?"

I answer, the Fellows have never made such claim; the Members in Council have made it a law, and unless that clause is rescinded it comes into force in 1886. I think it unfortunate, and an evidence of lukewarmness in the profession, that more members have not qualified themselves to take the position; and although I may be excused in not agreeing that the Fellowship practically disqualifies a member from holding such office, still, I should be prepared, if it was found to be the generel feeling of the profession, to vote for delaying for some years the putting of this clause into force; and should regret, equally with Mr. C., that certain Members of Council should be disqualified from holding that honourable and onerous position. At the same time, I must again point out that it would be an easy matter for them, "as men in attainments, of well-known high standing," to qualify.

NATIONAL VETERINARY MEDICAL ASSOCIATION.

The fact of my being president for this year of the above Association, is really the cause of my writing this letter. In the interests of that Association, I think it should be known to the members of the profession generally, what are the true facts of the case as to Scotland not being selected for its meeting this year. At the first meeting in London, there were invitations given to hold the next meeting from the Lancashire and Midland Counties' members. I was asked, as representing the Midland Counties, to withdraw in favour of Lancashire, it being thought, as a young society, that Lancashire might be the more popular place. Of the wisdom of that selection, no one who visited Manchester last July can doubt. With the withdrawal of our candidature, it was understood that we should have the first claim for a future meeting. Prior to the Manchester meeting, the Midland Counties' members were canvassed, and an almost unanimous vote was given in favour of asking the Association to hold its next meeting in Birmingham, and a written invitation was sent, inviting the Association to hold its 1885 meeting in Birmingham, and I believe I am correct in saying that this was the only invitation given. Certainly, Edinburgh was proposed and numerously supported at the Manchester meeting, but I believe if the true facts had been known, this would not have occurred. I would ask, with this explanation, will the remarks made at the time and since of snubbing the Scotch members, etc., apply? I think not; and I feel sure, although the Scotch members (much to the regret of their southern *confrères*) hold aloof from us in this matter, that if they will come forward and invite the society to go to Scotland in 1886, that their wishes would be complied with. I, for one, would support it. At the election of the Council of the Association at Manchester, I had the pleasure of nominating Mr. Cunningham as representing Scotland, and shall be glad to see him take up the cudgels in favour of the Association, and so induce his friends and neighbours to join in (what I believe to be) an association for the benefit of the profession generally. I hope they will attend the next meeting, and give us some evidence of their goodwill and support. I can assure them of a hearty welcome.

A good deal is said and written about the disadvantages laboured under, and the unfair treatment meted out to our friends in the North. We, on this

side of the Tweed, appear to be looked on as the natural enemies of the Scotch members. Such a feeling, I am quite sure, is contrary to the fact; for amongst my numerous acquaintances and friends in the profession, I have never heard such a feeling expressed; on the contrary, I believe the sentiments of members generally is for a fair representation of all classes, districts, and colleges, but the majority in veterinary, as in other politics, are sure to preponderate. If any class has a grievance, why do they not promulgate some well-considered scheme to alleviate it? Do Scotchmen and Scotch graduates disavow their brethren as soon as they come South? I think it will be found that there is a fair proportion of both in our governing body, although they may have come to seek their fortunes in Old England. Would the present President of the Royal College of Veterinary Surgeons be considered a Scotchman because he resides in Edinburgh? or the Principal of the London College a cockney on account of his residence in Camden Town?

I cannot agree with Mr. C. that "education, science, and gentlemanly demeanour" are the reverse of favourable to the veterinary surgeon. Before the profession can take its proper place in the scientific world all these must be necessities, and the possession of them in the true gentleman would cause him to laugh at the idea of being frightened to soil his hands to perform any necessary operation.

Apologising for the length of this letter,

HARRY OLVER.

Tamworth, *March 13th*, 1885.

SIR,—I am pleased to observe that your correspondent, Mr. Cunningham, has been taken down a peg or two by my criticism, and instead of vituperating and insulting members of the profession who do not happen to belong to his clique or to his side of the Border, he concentrates his venomed ferocity on those who have the misfortune nowadays to be Fellows of the Royal College, and manifests what manner of man he is in his allusion to myself. Not knowing who I am, his ferocious diatribes are as vapid and futile as his notions. I do not wear my heart upon my sleeve for such daws as Mr. Cunningham (and we have too many such as he) to peck at. Anonymity has its uses, especially when dealing with such people; and good work is often done by the anonymous.

The abuse which Mr. Cunningham and his friends across the Border indulge in cannot be accepted as argument; nor is it in any way calculated to do good. I do not, therefore, intend to notice him further in this direction, as there would be no advantage in arguing whether the groom, farrier, and shepherd class of veterinary surgeons, which he swears by, is a better one than that composed of well-educated, decent-mannered men. Everything depends upon taste and association. If unqualified practitioners are more numerous in England than in Scotland, I could give a more substantial reason than your correspondent affords.

With regard to the Fellows, who are so mercilessly reviled and traduced, all I can say is that I am not aware that they, as a body, have laid claim to anything exceptional, or done anything to merit such treatment. As I have already stated, they have shown a better spirit than those who abuse them. It is somewhat strange that, after so many years, an outcry is now being raised about the degree and the privileges it was intended to confer. It would seem that the Members of Council who obtained the Charter empowering it to grant the degree, made the mistake of imagining there was improvement and ambition in the profession, and that the Royal College of Veterinary Surgeons could be put on the same footing as the Royal College of Surgeons in this respect. Alas! if the utterances of Mr. Cunningham and some others

are to be taken as a *criterium*, we are a century behind that corporation. We have those among us who are better at throwing down than raising up—professional iconoclasts, who cannot tolerate anything but a dead level of dull and hopeless mediocrity. "Pity 'tis 'tis true." Mr. Cunningham's allusion to "luminaries" is amusing, especially when he localises them all in his own region. What does he mean by the term, might I ask? A farthing rushlight in a dark room may be a luminary. In the kingdom of the blind the one-eyed man is king. The light emitted by some of his so-called luminaries has been at times rather startling—especially with regard to Pleuro-pneumonia in American cattle and in America, the etiology of Tuberculosis, Glanders, etc. Luminaries, forsooth!

If Mr. Cunningham will favour us with the name of the person who retired from the Fellow Examinership, we shall know whether the statement is true; until then I shall consider it a figment of imagination. If it is true, then all I can say is that the individual must have been a mean sneak, destitute of courage to perform his duty.

With regard to the National Association, I am sure Mr. C. does his countrymen an injustice. They are not so mean as to sit on the coat-tails of their Southern colleagues, and seek to enjoy their amusement or increase their knowledge for nothing. That would be too characteristic of some North-countrymen. F.R.C.V.S.

PRACTICAL EDUCATION.

SIR,—In your last issue I notice a letter on the "Practical Education of Veterinary Students" from the pen of Mr. B. A. Clancy, Dublin.

Having graduated in the same year and at the same college, I was rather surprised to read some of his remarks, more especially that part of his letter in which he says, "Let it be demanded that the age of the horse, as shown by his teeth, may be lectured on." If Mr. Clancy cannot call to mind any of our principal's lectures (illustrated with dried specimens) on this important subject, I would ask him to look up his notes, and not only will he find that we had lectures on the subject, but also practical demonstrations in the college practice daily.

Again, in the same portion of his letter he makes a statement to the effect that certificates of soundness were only recently written once during the session; this is incorrect, and the only way I can account for Mr. Clancy's want of knowledge on this point is, that he must have been absent from the college at the different times when certificates of soundness *were* written.

Apologising for trespassing on your valuable space,

Newcastle-on-Tyne, *March 13th*, 1885. COLIN GRESTY, M.R.C.V.S.

"AN ECHO FROM THE COUNCIL CHAMBER."

SIR,—In the VETERINARY JOURNAL for February, at page 149, I pointed out that an outsider had to be called in to officiate as an examiner. In a foot-note the editor remarks, "We believe there is no foundation whatever for the statement in this paragraph." I am exceedingly sorry the editor has thought it necessary to give my statement such an emphatic contradiction. I think I need only adduce the fact that on several occasions, Mr. Rutherford has had to take the place of an examiner in cattle pathology, and only at the last examination Mr. Campbell had, at a short notice, to officiate as examiner on pathology, and Mr. Cunningham on horse anatomy, and Mr. Batt in London. These four gentlemen are all of them outsiders.

Again, at page 150, I speak of examiners doing double duty (which, in a footnote, he admits), and on one occasion one examiner did the duty of three examiners in one day. On this the editor expresses himself emphatically and says, "We never knew of such an occurrence." Surely, it should not be necessary for me to remind Dr. Fleming that in July last he had in one day to do his own work in pathology in the final; he had also to do Mr. Banham's morbid anatomy, and also Mr. Cox's practical horse—Mr. Banham having been taken suddenly ill, and Mr. Cox suddenly summoned home?

THOMAS GREAVES, F.R.C.V.S.

[Mr. Greaves does not fairly represent what we took objection to in the first paragraph of his letter. It was not to the statement that "outsiders," as he is pleased to designate members of the profession, have been called in on occasions when the regular examiners could not officiate to act for them; it was to the assertion that these gentlemen were "wholly unprepared, and probably wholly unfit," to examine, and that the passing or rejection of a student was decided by this "irregular, temporised, and incompetent Board." We claim to know more of the examinations than Mr. Greaves, and we repeat our expression that "there is no foundation whatever" for his statement. Such a Board would be perfectly regular; and, as for the incompetency of the gentlemen who have been called in to act on rare occasions, we challenge Mr. Greaves to name them and give proof of their incompetence.

With regard to the second objection to our remarks, the asterisk was, by mistake, placed wrongly. It should have been at the end of the sentence following that to which it was appended, and wherein Mr. Greaves asks if it is to be wondered at that an examiner's brain should be tired, wearied, and muddled when he officiated for one, or even two, of his colleagues. We repeat, in this instance also, that we never knew or heard of an examiner's brain being tired, wearied, and muddled through performing such a task; but if Mr. Greaves will furnish us with evidence of this, we will believe him; otherwise, being better informed as to this than he is, we maintain that his statement has no foundation. And we are certain that he can know little, if anything, of the fitness or unfitness of the examiners; while we can state positively that, on the occasion referred to by Mr. Greaves, Dr. Fleming did not feel either tired, wearied and muddled, or unfit to examine. It is not true that Messrs. Campbell, Cunningham, and Batt were asked to act as examiners at short notice at the last examinations, and neither are they "outsiders," but Members of the Royal College. We leave Mr. Greaves to pronounce them and Mr. Rutherford unprepared and incompetent for the duty they were requested, and kindly undertook, to perform.

It is very unfortunate that, owing to prejudiced information, and a feeling of discontent, Mr. Greaves' letter alluded to is simply a tissue of erroneous statements and baseless hypotheses.

Among other things, he states that the Scotch Board of Examiners consists of only eight members. The number is ten; and though he tries to show that the London School is more favoured in this and other respects, yet it is the fact that there is no difference whatever between it and the other schools.

We are astonished at the course Mr. Greaves has taken in this matter, as it will not enhance his reputation in any way, nor tend to advance—what he has always professed himself so anxious for—the unity of the profession.—ED. V. J.]

THE ROYAL COLLEGE ARMS.

DEAR SIR,—Can a registered practitioner use the coat of arms of the College—"*Vis unita fortior*"—on his labels and billheads? M.R.C.V.S.L.

[If, by using the Arms of the Royal College, a registered, or rather "existing" practitioner leads people to believe that he is a Fellow or Member of that college, then undoubtedly it is illegal. Our opinion is that he has no right whatever to use the arms of the college, and that he should be compelled to desist.—ED. V. J.]

AN APOLOGY.

SIR,—At page 105 of the *Veterinarian*, I stated that Professor Robertson "voted against the motion he had previously seconded." He writes, in this month's VETERINARY JOURNAL, page 220, "that he voted in the minority." When the votes were taken, I was very particular in counting every hand held up for the motion. His hand was certainly not seen by me; it must have been held up so low as to entirely escape my observation. Five or six Members of Council confirmed this decision. Under these circumstances it was natural to conclude that he voted in support of the views he had just expressed against the motion. If, however, it is as he says, I have done him a wrong; and, in appreciation of that feeling which every honest and honourable man should respect, I hasten to acknowledge the injustice I have unintentionally done him, and the doing which, I wish to say, I very much regret.

Knott Mill, *March 13th*, 1885. THOMAS GREAVES.

ELECTION OF MEMBERS OF COUNCIL.

SIR,—Whilst there is yet time, I would crave space for a few lines to call the attention of members of the profession to Clause 9 of the Supplemental Charter, granted on the 23rd August, 1876, which is now being discussed by some of the veterinary medical associations, and universally condemned, and which will ultimately place the profession in a most anomalous and helpless position if it be not revoked. I shall not now wait to inquire or bring forward any arguments to show that this ought to be done, as I think it unnecessary so to do, but merely to point out that it would facilitate this end, if, at the forthcoming election of councilmen, members and associations would agree to vote for those only who will pledge themselves in favour of this repeal, and assist in obtaining the necessary remedy to allow the whole of the profession to continue to have a voice in the management of its affairs, and not throw them entirely into the hands of a few self-elected "Fellows," however good they may be. JAS. P. S. WALKER.

Oxford, *March 10th*, 1885.

"BURSATTI."

SIR,—With respect to the subject of "fungus finding" in Bursatti, on which Mr. Steel, in the January number of the VETERINARY JOURNAL, dilates, I would beg to make a few observations, and to ask a few questions. In or about 1875, I remember reading an account by a Dr. Smith, of the Indian Medical Department, shortly followed up by that of Dr. Fleming, Staff-Surgeon, Indian Medical Department, on the pathology of Delhi Boil in man—a disease which has been said to bear many analogies to Bursatti in the horse, although differing from it in certain essential particulars.

Well, not many years later, I was surprised to find an article headed "Bursatti," the nature of which was also claimed to be fungal, by Mr. F. Smith, Veterinary Surgeon, Army Veterinary Department. This was shortly after followed up by another, of a similar nature, from the pen of Mr. Steel, then at Ipswich. To go into details would perhaps take up unnecessary space. Therefore, to be brief, this subject was taken up, and has since been taken up, not alone by us, in regard to Bursatti, but as concerns the fate of the parasite alleged to have been seen in Delhi Boil in man also. For, as my letter on the subject, in the VETERINARY JOURNAL for December, 1884, will show, the parasitic nature of Delhi Boil has been finally disproved. *Vide* also "Report on Oriental Sore," by Drs. Lewis and D. D. Cunningham, a copy of which may be had by applying to the Sanitary Commissioner with the Government of India.

We have given the subject of Bursatti our best consideration, and find that "parasites" are not characteristic of it. Be it also remembered that specimens of Bursatti sores submitted for examination many years since to Dr. Thin—no mean authority—failed to show any trace of the alleged parasites.

In conclusion I would beg to ask how is it—

(1) That similar parasites to those figured as found in Bursatti, occur also *in ordinary ulcers during the rains in India*, and parasites have been found also in *healthy* tissues which have been hardened in chromic acid or chromate of potash solutions?

(2) That the clinical history of the disease is *not* in accordance with the received notions of parasitic action?—Yours, obediently,

Cawnpore, *January*, 1885. R. W. BURKE, M.R.C.V.S.

INTERNAL TEMPERATURE AND TUBERCULOSIS.

SIR,—In these days, when one gets more kicks than halfpence, it is truly refreshing to find that there are still in existence men like my friend Mr. Harrison, whose tender mercies are the very opposite of cruel; and I have to acknowledge my obligations to that gentleman for the very tender manner in which he has handled me in his last letter, *in re* the internal temperature of animals. I can only explain the *very remarkable* results of Mr. Harrison's investigations by assuming that the Westmoreland cattle (at least, while they remain at home, for they certainly comport themselves, in the matter of temperature, in the same way as do all other reasonable bovines when they reach this part of the world) are more cold-blooded than any others, or that the thermometer used by Mr. H. was manufactured in the year 1. Had one of my pupils put into my hands such a statement as the one published by Mr. Harrison, I should have asked him if he had placed the right end of the thermometer in the rectum; but, joking apart, I would strongly advise Mr. H. to hang up his present thermometer as a memento of the past, and at once to procure a self-registering instrument from some reliable maker.

In reference to the subject of softening in the products of Tubercular Mammitis, I do not see that any other meaning can be attached to my remarks than that, personally, I have rarely seen either caseous or calcareous changes in the *udder lesions of Tuberculosis*. I am quite familiar with the differences which exist between calcareous and caseous retrogression, and I see no reason why I should alter my opinion in reference to the contamination of the milk in Tuberculosis; nor can it, I think, be too strongly insisted upon that unless softened matter—which is far more dangerous, as a source of local infection, than fibrous tubercle—gains access to the lactiferous ducts, or unless

tubercular ulcers are formed in the mucous membrane of the latter, Tuber cular Mammitis is not likely to produce milk contamination. Were the virus of tubercle always present in the blood stream—from which, so far as I know, it is absent until the lymphatic vessels, especially the thoracic duct or the inner coat of the blood vessels, become involved—I could understand that the various secretions of the body would, under all circumstances, become splendid channels for the dissemination thereof, and that not only would the milk, but the expired air, the saliva, the fæces, and the urine, become endowed with infective properties.

As to the nature of Scrofula, I should be very happy to oblige Mr. Harrison had I time to enter into a lengthy explanation on the subject. I can only refer him to my remarks thereon, at pp. 144-5, in the "The Four Bovine Scourges," and to the different works on pathology. I will, however, here say, what I am sure Mr. H. must also know perfectly well, that a very thin line of demarcation exists between scrofulous and tuberculous subjects, and that in the long run the vast majority of the former develop into the latter.

THOMAS WALLEY.

Royal Veterinary College, Edinburgh, *March 7th.*

VETERINARY THERMOMETRY.

SIR,—Mr. Macgillivray having been challenged by me in the January number of this Journal in regard to veterinary thermometry, etc., and having failed "to come up to time," I shall not have much to say to him further on this subject. Having, with your kind indulgence, been given the opportunity of (on this question) "nailing my colours to the mast," so far as the healthy temperature of animals in Westmoreland obtains under certain conditions, I would advise my friend (if he will allow me to call him so) to enjoin his numerous clients to ally a white bull to the black runts about Banff, with a view to suppress some of the extraordinary internal heat which the dark skin evidently induces in Scotch cattle. It would, in my opinion, if the climate is not too cold, much facilitate their adaptability for fattening purposes. I need not give a person of Mr. Macgillivray's extensive experience the "whys and wherefores" of this proposition, but I would ask him to give the profession his thermometrical observations on the last fifty out of all the thousands of cattle he has examined, with the results of his diagnosis aided by that instrument; as, on his own confession, he feels quite at a loss when a "good clinical thermometer is awanting." As to Professor Walley's disposal of my "wonderful fallacy about the 98·4° F. temperature," it may be considered (so far as the average is concerned), an open question yet. Mr. Macgillivray appears to have been quite astounded at my presumption to "write critically" on a subject I was quite ignorant of; all I can say is that there have always been fools of that description, and it remains for such highly intellectual beings as himself to suggest a remedy to stop them. Of course, "I put this little cap on, as there would be no joke if I did not. And then as to my Latin not being reconcilable" with the context; all I can say is that, when I am writing for the press, my pen is very apt to "dig" into the Latin or some other inharmonious tongue, and if it comes to my friend all "topsy-turvy," why, he might, one would think, try to gather the substance of what was meant without "airing his learning" by carping criticism. If my memory serves me right, I think I have noticed that Mr. Macgillivray, in some of his previous contributions to this Journal, is quite *au fait* in some of

the Continental languages. It is a pity no member of the profession has seen his way to tell him before. The Dutch temperatures which are quoted, together with the camels and elephants, have no relation with Westmoreland, so I pass them. There is nothing in Mr. Macgillivray's letter dated 14th February, 1885, that calls for any comment from me, excepting the concluding assertion, "namely, that the chief agent in propagating tubercle in man and the lower animals is our milk supply." I ask him (as a member of the veterinary profession) to substantiate this assertion by one or two solitary instances within his own extensive practice and observation.

Burtergill, Westmoreland, J. HARRISON, M.R.C.V.S.
March 9th, 1885.

COMPRESSED RATIONS FOR CAMELS.

SIR,—As one who has taken much interest in questions affecting army cattle and transport, I would ask your permission to direct the attention of your readers to a remark contained in a small pamphlet written by Captain S. S. Parkyn, late Royal Irish, Assistant-Superintendent of Transport in Southern Afghanistan, in 1878-80.*

Speaking of the treatment of camels, Capt. Parkyn says :—"With regard to the grain ration, I have already stated that I do not consider it proper food for a camel, in an unprepared state. From experience with some thousands of camels, I have invariably noticed that in nearly all cases the grain is not properly digested. *Compressed food might, I am sure, be prepared, containing the proper ingredients.* This is particularly necessary for animals moving with troops, where the baggage-animal has to move in accordance with the convenience of the troops, and therefore fares badly."

I do not know if this suggestion has been yet tried, but venture to think that wherever the carriage of such rations is admissible, a portable, well-chosen ration for the camels would well repay any trouble bestowed on its preparation. The possibility of dispensing with the harassing guards which are requisite when the animals are sent out to graze would, in itself, be a boon to the troops, apart from the prospect of the animals being kept better up to their work than either on unaccustomed food, like grain alone, or on what they can pick up for themselves. Of the latter method the late General Sir Charles Napier once gave a graphic sketch, in his own pithy way. The camels, by all accounts, have been faring rather badly of late. Perhaps the present lull might afford opportunities for improvement in the direction suggested. A desire that the question may be better ventilated must be my apology for thus intruding on your space, and on the attention of those better qualified than I am to deal with such matters. H. M. C.

11th March, 1885.

* "Transport in Southern Afghanistan, 1878-80." By Lieut. S. S. Parkyn. Second edition. Liddell and Son, Bodmin, 1882.

THE MAYER FUND.

MR. CAMMACK, M.R.C.V.S., Cape Colony, has forwarded a contribution of £5 towards this fund. Application for it to be made to the Editor of the VETERINARY JOURNAL.

TO CORRESPONDENTS.

JUSTICE.—The evidence you bring in support of your charge against the gentleman you name is too slender to warrant the publication of your letter in our overcrowded pages.

G. S. A.—No good could arise from your criticism, which would appear trivial. We are all human, printers included.

COMMUNICATIONS from Messrs. Gresswell, Nunn, T. Campbell, Hoare, MacCallum, and others, together with the reports of the Lancashire, Liverpool, and Royal Counties Societies, are crowded out of this number, but will appear in our next.

Communications, Books, Journals, etc., Received.

COMMUNICATIONS have been received from Messrs. Leather and Sons, Liverpool; J. S. Hurndall, Liverpool; "M.R.C.V.S.L."; A. Barron, Liverpool; T. Greaves, Manchester; R. H. Dyer, Limerick; E. Beddard, Wolverhampton; H. M. Singleton, Ealing; E. P. Evans, Cardiff; J. Cammack, Kimberley, South Africa; R. W. Burke, Cawnpore; Professor Walley, Edinburgh; "Experientia Docet"; H. Olver, Tamworth; W. Hunting, London; E. Kitchin, London; "G. S. A."; T. H. Lewis, Edinburgh; A. MacCallum, Edinburgh; "H. M. C."; T. Campbell, Kirkcudbright; C. Gresty, Newcastle-on-Tyne; J. Harrison, Burtergill; J. P. S. Walker, Oxford; E. W. Hoare, Montreal; J. B. Wolstenholme, Manchester; Messrs. Gresswell, Louth; H. Kidd, Hungerford; "F.R.C.V.S."; Professor Robertson, London; H. Dyer, Leatherhead; R. W. Knowles, Wisbeach; W. R. Davis, Isle of Man; G. Gartside Mayor, Kirkham; J. Mannington, Brighton.

BOOKS AND PAMPHLETS: *F. Eichbaum*, Grundriss der Geschichte der Thierheilkunde; *F. Negrini*, Del Fegato degli Animali Equini; *A. Miglioranza*, La Rabbia nell' Uomo e negli Animali; Indian Civil Veterinary Reports; *J. W. Hill*, The Diseases of Poultry; *Dr. J. M. Wehenkel*, Rapport sur l'Etat Sanitaire des Animaux Domestiques; *Paul Q. Karkeek*, Chaucer's Schipman and his Barge, "The Maudelayne"; Bulletin de la Société Royale Protectrice des Animaux; *J. M. Wehenkel*, Bulletin du Comité Consultatif pour les affaires relatives aux Epizooties et à la Police Sanitaire des Animaux Domestiques.

JOURNALS, ETC.: *Revista Popular de la Exposicion Rural; Tidskrift für Veterinar-Medicin; Journal of Comparative Medicine and Surgery; American Veterinary Review; Wochenschrift für Thierheilkunde und Viehzucht; Scottish Agricultural Gazette; British and Colonial Druggist; Lancet; Der Thierarzt; British Medical Journal; Live Stock Journal; Animal World; Mark Lane Express; Annales de Mèdicine Vétérinaire; Revue Vétérinaire; Repertorium für Thierheilkunde; Archives Vétérinaire; Archiv für Wissenschaftliche; Œsterreichische Vierteljahresschrift für Wissenschaftliche Veterinärkunde; Der Hufschmied; Chicago Live Stock Journal; Clinica Veterinaria; Edinburgh Medical Journal; Kansas Live Stock Indicator.*

NEWSPAPERS: *Edinburgh Evening News; Times of India; Madras Mail; Edinburgh Courant; York Herald.*